This document provides pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Major, Municipal permit. The discharge results from the operation of a 0.50 MGD wastewater treatment plant. This permit will include expansion flows of 1.5 MGD and 3.0 MGD. This permit action consists of updating the proposed effluent limits to reflect the current Virginia Water Quality Standards, effective 6 January 2011 and updating permit language as applicable. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1.	Facility Name and Mailing Address:	Caroline County Regional WWTP P.O. Box 424 Bowling Green, VA 22427	SIC Code:	4952 WWTP
	Facility Location:	22101 Rogers Clark Blvd Ruther Glen, VA 22546	County:	Caroline
	Facility Contact Name:	Joshua Carson / Chief Operator	Telephone Number:	804-448-0922
2.	Permit No.:	VA0073504	Expiration Date:	17 June 2012
	Other VPDES Permits:	VAR051710 – Industrial Stormwater General Permit VAN030045 – Watershed General Permit		
	Other Permits:	Not Applicable		
	E2/E3/E4 Status:	Not Applicable		
3.	Owner Name:	Caroline County Public Utilities		
	Owner Contact / Title:	Joseph Schiebel Interim Director of Public Utilities	Telephone Number:	804-633-4390
4.	Application Complete Date:	30 January 2012		
	Permit Drafted By:	Douglas Frasier	Date Drafted:	7 March 2012
	Draft Permit Reviewed By:	Alison Thompson	Date Reviewed:	27 March 2012
	WPM Review By:	Bryant Thomas	Date Reviewed:	10 April 2012
	Public Comment Period:	Start Date: TBD 2012	End Date:	TBD 2012
5.	Receiving Waters Information:			
	Receiving Stream Name:	Polecat Creek	Stream Code:	8-PCT
	Drainage Area at Outfall:	34.3 square miles*	River Mile:	5.92*
	Stream Basin:	York River	Subbasin:	None
	Section:	03	Stream Class:	III
	Special Standards:	None	Waterbody ID:	VAN-F20R
	7Q10 Low Flow:	0.0 MGD**	7Q10 High Flow:	0.0 MGD**
	1Q10 Low Flow:	0.0 MGD**	1Q10 High Flow:	0.0 MGD**
	30Q10 Low Flow:	0.0 MGD**	30Q10 High Flow:	0.0 MGD**
	Harmonic Mean Flow:	0.0 MGD**	30Q5 Flow:	0.0 MGD**
	303(d) Listed:	Yes – Aquatic Life Use for dissolved oxygen (DO) and pH		
	TMDL Approved:	No – 2022 & 2016, respectively	Date TMDL Approved:	Not Applicable

*Updated with this reissuance – see **Attachment 5.**

**At the point of discharge, the receiving stream does not have a natural, defined channel; indicative of marsh waters.

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

✓	State Water Control Law		EPA Guidelines
✓	Clean Water Act	✓	Water Quality Standards
✓	VPDES Permit Regulation	✓	Other: 9VAC25-820 et seq. – *Nutrient Watershed General Permit* 9VAC25-720 et seq. – *Water Quality Management Plan Regulation* 9VAC25-40 et seq. – *Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed*
✓	EPA NPDES Regulation		

7. Licensed Operator Requirements: Class II at the design flows of 0.50 MGD and 1.5 MGD.

Class I upon issuance of the CTO for the 3.0 MGD facility.

8. Reliability Class: Class I at all design flows.

9. Permit Characterization:

___	Private	✓	Effluent Limited	___	Possible Interstate Effect
___	Federal	✓	Water Quality Limited	___	Compliance Schedule Required
___	State	✓	Toxics Monitoring Program Required	___	Interim Limits in Permit
✓	POTW	✓	Pretreatment Program Required	___	Interim Limits in Other Document
___	TMDL				

10. Wastewater Sources and Treatment Description:

Influent enters a pump station prior to the headworks. The headworks consist of two parallel channels each equipped with manually cleaned coarse bar screens, followed by a vortex-type grit chamber (currently not in service). Magnesium hydroxide is introduced at this point for alkalinity. Wastewater then flows to the aeration basin (oxidation ditch) equipped with mechanical disc aerators. A distribution box divides flow between two clarifiers. Clarified effluent flows to the filter influent pump station then to the tertiary filters. Filtered effluent flows to the ultraviolet (UV) disinfection unit followed by a series of cascade aeration steps before final discharge to Polecat Creek.

Septage receiving facilities include a screen, two aerated holding tanks and a pumping station. Septage can be introduced into the treatment works via the digestion tank or the headworks at the influent pump station.

Solids handling facilities include an aerated sludge digestion tank, drying beds, belt filter press, chemical feed and sludge cake handling appurtenances.

The facility, at the time of this Fact Sheet, is under construction, expanding the current 0.50 MGD plant to 1.5 MGD. The upgrades during construction include a mechanical barscreen, a five-stage Bardenpho activated sludge process unit and a tertiary denitrification filtration system.

See **Attachment 1** for a facility schematic/diagram.

See **Attachment 2** for the Certificate to Construct.

TABLE 1
OUTFALL DESCRIPTION

Number	Discharge Sources	Treatment	Design Flows	Latitude / Longitude
001	Domestic / Commercial Wastewater	See Section 10	0.50 MGD (expansions at 1.5 and 3.0 MGD)	37° 57' 54.1'' / 77° 25' 14.9''
See **Attachment 3** for the Ruther Glen topographic map.				

11. Sludge Treatment and Disposal Methods:

Wasted sludge is aerobically digested with a solids retention time (SRT) of 12 – 17 days prior to being dewatered via a belt filter press. The facility does not digest to Class B Standards. The sludge is transported to the Old Dominion Landfill (permit number SWP553) located at 2001 Charles City Road, Richmond, VA for final disposal. The WWTP generates approximately 115 dry metric tons per year.

12. Discharges and Monitoring Stations within waterbody VAN-F20R:

TABLE 2 DISCHARGES & MONITORING STATIONS			
ID / Permit Number	Facility Name	Type	Receiving Stream
VA0085871	Love's Travel Stop #435	Stormwater Discharge	Polecat Creek, UT
VA0090930	Lake Caroline WTP (nonoperational)	Industrial Discharge	Stevens Mill Run
VAR051972	Reynolds Used Auto Parts	Industrial Stormwater General Permit	Lake Caroline, UT
8-PCT002.29	DEQ Monitoring Station		Polecat Creek

13. Material Storage:

TABLE 3 MATERIAL STORAGE		
Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Liquid Alum	10,000 gallons	Best Management Practices (BMPs)
Magnesium Hydroxide	3,000 gallons	

14. Site Inspection: Performed by DEQ-NRO Compliance Staff on 15 February 2011 (see **Attachment 4**).

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data

Polecat Creek is monitored at DEQ monitoring station 8-PCT002.29; located approximately 3.6 miles downstream of Outfall 001 at the Route 601 bridge crossing. Polecat Creek has been listed as impaired for the Aquatic Life Use due to excursions for dissolved oxygen and pH. The Total Maximu m Daily Loads (TMDLs) for these impairments are expected in 2022 and 2016, respectively. However, if it is determined that the aforementioned excursions are caused by natural conditions, the TMDLs will not be required.

The full planning statement is found in **Attachment 5**.

Significant portions of the Chesapeake Bay and its tributaries are listed as impaired on Virginia's 303(d) list of impaired waters for not meeting the aquatic life use support goal. Additionally, the 2010 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report indicates that much of the mainstem Bay does not fully support this use support goal under Virginia's Water Quality Assessment guidelines. Nutrient enrichment is cited as one of the primary causes of impairment. EPA issued the Bay TMDL on 29 December 2010. It was based, in part, on the Watershed Implementation Plans developed by the Bay watershed states and the District of Columbia.

The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries that are on the impaired waters list. As with all TMDLs, a maximum aggregate watershed pollutant loading necessary to achieve the Chesapeake Bay's water quality standards has been identified. This aggregate watershed loading is divided among the Bay states and their major tributary basins, as well as by major source categories (i.e. wastewater, urban storm water, onsite/septic agriculture, air deposition). Fact Sheet Section 17.e. provides additional information on specific nutrient limitations for this facility to implement the provisions of the Chesapeake Bay TMDL.

b. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, Polecat Creek, is located within Section 3 of the York River Basin and designated as Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32° C and maintain a pH of 6.0 – 9.0 standard units (S.U.).

Attachment 6 details other water quality criteria applicable to the receiving stream.

Ammonia:

The fresh water, aquatic life Water Quality Criteria for Ammonia is dependent on the instream temperature and pH. The 90th percentile temperature and pH values are used because they best represent the critical conditions of the receiving stream. Since it is staff's best professional judgement that the critical 30Q10 flow of the receiving stream is 0.0 MGD, effluent pH and temperature data may be used to establish the ammonia criterion. Staff utilized effluent pH data as reported on the July 2007 – November 2011 Discharge Monitoring Reports. Since there is no temperature data readily available for staff's use, a default temperature value of 25° C for summer and an assumed value of 15° C for the winter months were utilized.

The ammonia criteria can be found in **Attachment 6**

Metals Criteria:

The Water Quality Criteria for some metals are dependent on the receiving stream and/or effluent hardness values (expressed as mg/L calcium carbonate). There is no hardness data available for the receiving stream and the effluent values are artificially elevated due to the addition of magnesium hydroxide at the headworks. The average hardness value, per the permit application, was reported at 403 mg/L as $CaCO_3$; therefore, staff has proposed utilizing an effluent hardness value of 94 mg/L that was ascertained during the last reissuance. This recognizes the hardness values that would normally occur prior to the chemical addition.

The hardness-dependent metals criteria shown in **Attachment 6** are based on this average value.

Bacteria Criteria:

The Virginia Water Quality Standards 9VAC25-260-170.A state that the following criteria shall apply to protect primary recreational uses in surface waters:

E. coli bacteria per 100 mL of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 mL)	126

[1]For a minimum of four weekly samples taken during any calendar month

c. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Polecat Creek, is located within Section 3 of the York River Basin. This section has not been designated with a special standard.

d. Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on 3 February 2012 for records to determine if there are threatened or endangered species in the vicinity of the discharge. The following threatened species were identified within a 2 mile radius of the discharge: Upland Sandpiper (song bird); Loggerhead Shrike (song bird); Bachman's Sparrow; Bald Eagle; and Migrant Loggerhead Shrike (song bird). The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and protect the threatened species found near the discharge.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained.

Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The permit limits established for this facility were developed recognizing the ecological characteristics of a marsh or swamp environment. The limits were calculated to maintain the Virginia Water Quality Standards and to protect the existing water quality of the receiving waters. Because of this, it is staff's best professional judgment that the waterbody is a Tier I water.

17. Effluent Screening, Wasteload Allocation and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points are equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLAs) are calculated. In this case since the critical 7Q10, 30Q10 and 1Q10 flows have been determined to be zero, the WLAs are equal to the WQS. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are based on the most limiting WLA, the required sampling frequency and statistical characteristics of the effluent data.

a. Effluent Screening

Effluent data obtained from Discharge Monitoring Reports (DMRs) and the permit application has been reviewed and determined to be suitable for evaluation.

The following pollutants require a wasteload allocation analysis: Cadmium, Copper, Nickel and Zinc.

b. Mixing Zones and Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- C_o = In-stream water quality criteria
- Q_e = Design flow
- Q_s = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; harmonic mean for carcinogen-human health criteria; 30Q10 for ammonia criteria; and 30Q5 for non-carcinogen human health criteria)
- f = Decimal fraction of critical flow
- C_s = Mean background concentration of parameter in the receiving stream.

The water segment receiving the discharge via Outfall 001 is considered to have a 7Q10, 1Q10 and 30Q10 of 0.0 MGD. As such, there is no mixing zone and the WLA is equal to the C_o.

c. Effluent Limitations, Outfall 001 – Toxic Pollutants

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D. requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1). Ammonia as N / Total Kjeldahl Nitrogen:

Staff utilized effluent pH reported on the July 2007 – November 2011 Discharge Monitoring Reports during the last permit term and default temperature values to determine the ammonia water quality criteria. DEQ guidance suggests using a sole data point of 9.0 mg/L to ensure the evaluation adequately addresses the potential for ammonia to be present in a discharge containing domestic sewage. The resulting wasteload allocations (WLAs) produced a monthly average ammonia limit of 1.6 mg/L (**Attachment 7**).

During the last reissuance, staff carried forward a Total Kjeldahl Nitrogen (TKN) limit of 3.0 mg/L. The current VPDES Permit Manual discusses applying this limit in instances where mixing is rather limited such as a swamp environment. As the waste stream is treated, the ammonia component of TKN is converted to Nitrate (NO_3) and Nitrite (NO_2). It is estimated that a facility achieving a TKN limit of 3.0 mg/L essentially removes ammonia from the waste stream, resulting in a 'self-sustaining' quality effluent that protects against ammonia toxicity.

It is staff's best professional judgement that a TKN monthly average limit of 3.0 mg/L is still protective given the aforementioned and will be carried forward in this reissuance. The weekly average limit will be 4.5 mg/L based on a multiplier of 1.5 times the monthly average.

2). Total Residual Chlorine:

This facility utilizes ultraviolet (UV) light for disinfection; therefore, chlorine limitations are not warranted.

3). Metals:

It was ascertained that limits for Zinc are still warranted; therefore, quarterly monitoring will be carried forward with this reissuance.

It was also determined that no limits were needed for Copper. However, 9VAC25-31-220.L (Antibacksliding) does not allow for less stringent effluent limitations than those in the previous permit except under specific circumstances; such as, substantial alterations to the permitted facility. Therefore, after the plant upgrades are complete and monitoring data indicates that Copper levels remain at current concentrations; staff may consider removing the monitoring requirement during the next reissuance.

The facility shall continue monitoring for Copper on an annual basis during this permit term.

See **Attachment 8** for limit determinations.

d. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to carbonaceous-Biochemical Oxygen Demand-5 day ($cBOD_5$), Total Suspended Solids (TSS), Total Kjeldahl Nitrogen (TKN) and pH limitations are proposed.

The minimum monthly average for Dissolved Oxygen (D.O.) was changed with this reissuance to reflect the current VPDES Permit Manual regarding limitations for swamp and marsh waters.

$cBOD_5$, TSS, Dissolved Oxygen and TKN limitations are based on best professional judgement and Guidance Memo 00-2011. This guidance is applicable to waters such as this portion of Polecat Creek where conditions are indicative of marsh waters and cannot be modeled.

It is staff's practice to equate the Total Suspended Solids limits with the $cBOD_5$ limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

E. coli limitations are in accordance with the Water Quality Standards 9VAC25-260-170.

e. Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients

VPDES Regulation 9VAC25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay.

As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries.

Only concentration limits are included in the individual VPDES permit when the facility installs nutrient removal technology. The basis for the limitations is 9VAC25-40 – *Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed* which requires new or expanding discharges with design flows of $\geq$ 0.04 MGD to treat for TN and TP to either BNR levels (TN = 8.0 mg/L; TP = 1.0 mg/L) or SOA levels (TN = 3.0 mg/L and TP = 0.30 mg/L).

This facility has also obtained coverage under 9VAC25-820 – *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia*. This regulation specifies and controls the nitrogen and phosphorus loadings from facilities and specifies facilities that must register under the general permit. Nutrient loadings for those facilities registered under the general permit as well as compliance schedules and other permit requirements shall be authorized, monitored, limited and otherwise regulated under the general permit and not this individual permit. This facility has coverage under this General Permit; the permit number is VAN030045. Total Nitrogen and Total Phosphorus Annual Loads from this facility are found in 9VAC25-720 – *Water Quality Management Plan Regulation* which sets forth TN and TP maximum wasteload allocations for facilities designated as significant discharges, i.e., those with design flows of $\geq$ 0.5 MGD above the fall line and $\geq$ 0.1 MGD below the fall line.

Monitoring for Nitrates + Nitrites, Total Nitrogen and Total Phosphorus are included in this permit at the 1.5 MGD and 3.0 MGD expanded flows. The monitoring is needed to ensure protection of the Water Quality Standards of the Chesapeake Bay. Monitoring frequencies reflect those as set forth in 9VAC25-820. Annual average effluent concentration limitations, as well as monthly and year to date calculations for Total Nitrogen and Total Phosphorus are included in this individual permit at the expanded design flows. The annual average for TN at 3.0 mg/L is based on 9VAC25-40 and GM07-2008. The annual averages for TP at 0.13 mg/L and 0.07 mg/L at the 1.5 MGD and 3.0 MGD design flows, respectively, are based on GM07-2008 and the off-set plan submitted by Caroline County demonstrating the treatment level required for phosphorus in order to achieve the WLA pursuant to 9VAC25-720 (see **Attachment 9**).

It is also staff's best professional judgment that a monthly Total Phosphorus limitation of 2.0 mg/L remains in this reissuance to ensure that algal blooms are controlled at the 0.50 MGD design flow. It is staff's experience that STP discharges without Phosphorus controls will cause algal blooms in ponds, small impoundments and still waters in general. Since there is no model or chlorophyll criteria by which to derive a Phosphorus limit, staff use their experience with facilities that must comply with the 2.0 mg/L requirements of the Nutrient Policy and require the same limit. This limit has been shown to provide sufficient Phosphorus control to avoid nuisance algal blooms. The regulatory basis for this approach is 9VAC25-31-220.D.

The monthly Total Phosphorus limitation of 2.0 mg/L is proposed to be removed at the 1.5 MGD and 3.0 MGD design flows. The facility is currently under construction and should be designing to meet annual averages of 0.13 mg/L and 0.07 mg/L for Total Phosphorus at the expanded flows. Therefore, since this discharge is covered under the nutrient General Permit and is currently upgrading, it is staff's best professional judgement that the above monthly average of 2.0 mg/L for Total Phosphorus can be removed at the expanded design flows.

f. Effluent Limitations and Monitoring Summary

The effluent limitations are presented in the following table. Limits were established for cBOD$_5$, Total Suspended Solids, Total Kjeldahl Nitrogen, pH, Dissolved Oxygen, *E. coli*, Nitrate+Nitrite, as N, Total Nitrogen, Total Phosphorus, Total Recoverable Copper and Total Recoverable Zinc.

The limit for Total Suspended Solids is based on Best Professional Judgement.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and then a conversion factor of 3.785.

The mass loading (lb/d) for TKN monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and then a conversion factor of 8.3438.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual and 9VAC25-820.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for cBOD and TSS (or 65% for equivalent to secondary). The limits in this permit are water quality-based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19a. Effluent Limitations/Monitoring Requirements:

Design flow is 0.50 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until issuance of the CTO for the 1.5 MGD facility or the permit's expiration date, whichever comes first.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
$cBOD_5$	3,4	10 mg/L 19 kg/day	15 mg/L 28 kg/day	NA	NA	3D/W	8H-C
Total Suspended Solids (TSS)	2,4	10 mg/L 19 kg/day	15 mg/L 28 kg/day	NA	NA	3D/W	8H-C
Dissolved Oxygen (DO)	3	NA	NA	5.0 mg/L	NA	1/D	Grab
Total Kjeldahl Nitrogen (TKN)	2,3,4	3.0 mg/L 13 lb/day	4.5 mg/L 19 lb/day	NA	NA	3D/W	8H-C
E. coli (Geometric Mean) [(a)]	3	126 n/100 mL	NA	NA	NA	3D/W	Grab
Total Phosphorus	2,4	2.0 mg/L	NA	NA	NA	1/2W	8H-C
Copper, Total Recoverable	2,3	20 µg/L	NA	NA	NA	1/Y	Grab
Zinc, Total Recoverable [(b)]	3	110 µg/L	NA	NA	NA	1/Q	Grab
Chronic Toxicity – *C. dubia* (TU_c) [(c)]		NA	NA	NA	NL	1/Y	8H-C
Chronic Toxicity – *P. promelas* (TU_c) [(c)]		NA	NA	NA	NL	1/Y	8H-C

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. Current VPDES Permit Manual

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.
TIRE = Totalizing, indicating and recording equipment.

1/D = Once every day.
3D/W = Three days a week.
1/2W = Once every 2 weeks.
1/Q = Once every calendar quarter.
1/Y = Once every calendar year.

8H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 8-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of eight (8) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum eight (8) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

[(a)] Samples shall be collected between the hours of 10 A.M. and 4 P.M.

[(b)] The quarterly monitoring periods shall be January through March, April through June, July through September, and October through December. The DMR shall be submitted no later than the 10th day of the month following the monitoring period.

[(c)] See Section 20.c. for the Whole Effluent Toxicity Program.

19b. Effluent Limitations/Monitoring Requirements:

Design flow is 1.5 MGD.

Effective Dates: During the period beginning with the issuance of the CTO for the 1.5 MGD facility and lasting until issuance of the CTO for the 3.0 MGD facility or the permit's expiration date, whichever comes first.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
$cBOD_5$	3,4	10 mg/L 57 kg/day	15 mg/L 85 kg/day	NA	NA	5D/W	24H-C
Total Suspended Solids (TSS)	2,4	10 mg/L 57 kg/day	15 mg/L 85 kg/day	NA	NA	5D/W	24H-C
Dissolved Oxygen (DO)	3	NA	NA	5.0 mg/L	NA	1/D	Grab
Total Kjeldahl Nitrogen (TKN)	2,3,4	3.0 mg/L 38 lb/day	4.5 mg/L 56 lb/day	NA	NA	5D/W	24H-C
E. coli (Geometric Mean) [a]	3	126 n/100 mL	NA	NA	NA	5D/W	Grab
Nitrate+Nitrite, as N	3,5	NL mg/L	NA	NA	NA	1/W	24H-C
Total Nitrogen [b]	3,5	NL mg/L	NA	NA	NA	1/W	Calculated
Total Nitrogen – Year to Date [c]	3,5	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen – Calendar Year [c]	3,5	3.0 mg/L	NA	NA	NA	1/Y	Calculated
Total Phosphorus	2,4	NL mg/L	NA	NA	NA	1/W	24H-C
Total Phosphorus – Year to Date [c]	3,5	NL mg/L	NA	NA	NA	1/M	Calculated
Total Phosphorus – Calendar Year [c]	3,6	0.13 mg/L	NA	NA	NA	1/Y	Calculated
Copper, Total Recoverable	3	20 µg/L	NA	NA	NA	1/Y	Grab
Zinc, Total Recoverable [d]	3	110 µg/L	NA	NA	NA	1/Q	Grab
Chronic Toxicity – *C. dubia* (TU_c) [d][e]		NA	NA	NA	NL	1/Q	24H-C
Chronic Toxicity – *P. promelas* (TU_c) [d][e]		NA	NA	NA	NL	1/Q	24H-C

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. Current VPDES Permit Manual
5. 9VAC25-40 (Regulation for Nutrient Enriched Waters)
6. 9VAC25-720 (WQMP Regulation) / **Attachment 9**

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.
TIRE = Totalizing, indicating and recording equipment.

1/D = Once every day.
5D/W = Five days a week.
1/W = Once every week.
1/M = Once every month.
1/Q = Once every calendar quarter.
1/Y = Once every calendar year.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

[a] Samples shall be collected between the hours of 10 A.M. and 4 P.M.

[b] Total Nitrogen = Sum of TKN plus Nitrate+Nitrite.

[c] See Section 20.a. for Nutrient Calculations.

[d] The quarterly monitoring periods shall be January through March, April through June, July through September, and October through December. The DMR shall be submitted no later than the 10th day of the month following the monitoring period.

[e] See Section 20.c. for the Whole Effluent Toxicity Program.

19c. Effluent Limitations/Monitoring Requirements:

Design flow is 3.0 MGD.

Effective Dates: During the period beginning with the issuance of the CTO for the 3.0 MGD facility and lasting until the permit's expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
$cBOD_5$	3,4	10 mg/L 114 kg/day	15 mg/L 170 kg/day	NA	NA	5D/W	24H-C
Total Suspended Solids (TSS)	2,4	10 mg/L 114 kg/day	15 mg/L 170 kg/day	NA	NA	5D/W	24H-C
Dissolved Oxygen (DO)	3	NA	NA	5.0 mg/L	NA	1/D	Grab
Total Kjeldahl Nitrogen (TKN)	3,4	3.0 mg/L 75 lb/day	4.5 mg/L 113 lb/day	NA	NA	5D/W	24H-C
E. coli (Geometric Mean) [(a)]	3	126 n/100 mL	NA	NA	NA	1/D	Grab
Nitrate+Nitrite, as N	3,5	NL mg/L	NA	NA	NA	1/W	24H-C
Total Nitrogen [(b)]	3,5	NL mg/L	NA	NA	NA	1/W	Calculated
Total Nitrogen – Year to Date [(c)]	3,5	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen – Calendar Year [(c)]	3,5	3.0 mg/L	NA	NA	NA	1/Y	Calculated
Total Phosphorus	2,4	NL mg/L	NA	NA	NA	1/W	24H-C
Total Phosphorus – Year to Date [(c)]	3,5	NL mg/L	NA	NA	NA	1/M	Calculated
Total Phosphorus – Calendar Year [(c)]	3,6	0.07 mg/L	NA	NA	NA	1/Y	Calculated
Copper, Total Recoverable	3	20 µg/L	NA	NA	NA	1/Y	Grab
Zinc, Total Recoverable [(d)]	3	110 µg/L	NA	NA	NA	1/Q	Grab
Chronic Toxicity – *C. dubia* (TU_c) [(d)] [(e)]		NA	NA	NA	NL	1/Q	24H-C
Chronic Toxicity – *P. promelas* (TU_c) [(d)] [(e)]		NA	NA	NA	NL	1/Q	24H-C

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. Current VPDES Permit Manual
5. 9VAC25-40 (Regulation for Nutrient Enriched Waters)
6. 9VAC25-720 (WQMP Regulation) / **Attachment 9**

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.
TIRE = Totalizing, indicating and recording equipment.

1/D = Once every day.
5D/W = Five days a week.
1/W = Once every week.
1/M = Once every month.
1/Q = Once every calendar quarter.
1/Y = Once every calendar year.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

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[(a)] Samples shall be collected between the hours of 10 A.M. and 4 P.M.

[(b)] Total Nitrogen = Sum of TKN plus Nitrate+Nitrite.

[(c)] See Section 20.a. for Nutrient Calculations.

[(d)] The quarterly monitoring periods shall be January through March, April through June, July through September, and October through December. The DMR shall be submitted no later than the 10th day of the month following the monitoring period.

[(e)] See Section 20.c. for the Whole Effluent Toxicity Program.

20. Other Permit Requirements:

a. Permit Section Part I.B. contains quantification levels and compliance reporting instructions.

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

The calculations for the Nitrogen and Phosphorus parameters shall be in accordance with the calculations set forth in 9VAC25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia*. §62.1-44.19:13 of the Code of Virginia define how annual nutrient loads are to be calculated; this is carried forward in 9VAC25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, these reporting calculations are intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

b. Permit Section Part I.C. details the requirements of a Pretreatment Program.

The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.D. requires all discharges to protect water quality. VPDES Permit Regulation, 9VAC25-31-730 through 900. and 40 CFR Part 403 requires POTWs with a design flow of > 5 MGD and receiving from Industrial Users (IUs) pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards to develop a pretreatment program.

Approximately 60% of the wastewater originates from non-domestic sources (light industry) with three (3) of those sources classified as Significant Industrial Users (SIUs) pursuant to the Pretreatment Regulations, 9VAC25-31-730; a pretreatment program is warranted. The program was approved by DEQ-NRO staff on 22 January 2001.

It should be noted that one of the SIUs has applied for a discharge permit from DEQ-NRO. Once a permit is issued to this facility, the SIU will disconnect from the Caroline County Regional WWTP.

Program requirements and reporting are found in this section of the permit.

c. Permit Section Part I.D. details the requirements for Whole Effluent Toxicity Program.

The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.I, requires limitations in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. A TMP is imposed for municipal facilities with a design rate >1.0 MGD, with an approved pretreatment program or required to develop a pretreatment program, or those determined by the Board based on effluent variability, compliance history, IWC and receiving stream characteristics.

The Caroline County Regional WWTP has an approved pretreatment program and is currently expanding to 1.5 MGD; therefore, a program is warranted. Until the CTO is issued for the 1.5 MGD or 3.0 MGD facility, the treatment plant will continue with annual monitoring. Within six (6) months after issuance of the CTO for the 1.5 MGD and 3.0 MGD design flows, the facility shall initiate quarterly monitoring. The permittee shall collect a total of eight (8) quarterly samples; thereafter, annual monitoring shall commence unless quarterly test results indicate possible toxicity.

See **Attachment 10** for summary of previous test results.

21. Other Special Conditions:

a. 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.4. requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.

b. Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-200 B.1. and B.2. for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c. O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d. CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.

e. Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200.C., and Rules and Regulations for Waterworks and Wastewater Works Operators (18VAC160-20-10 et seq.) requires licensure of operators.

- This facility requires a Class II operator for the 0.50 MGD and 1.5 MGD design flows.
- This facility will require a Class I operator for the 3.0 MGD design flow.

f. Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet reliability Class I.

g. Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-220.C. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

h. Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2., and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

i. Nutrient Offsets. The Virginia General Assembly, in their 2005 session, enacted Article 4.02 (Chesapeake Bay Watershed Nutrient Credit Exchange Program) to the Code of Virginia to address nutrient loads to the Bay. Section 62.1-44.19:15 sets forth the requirements for new and expanded dischargers, which are captured by the requirements of the law, including the requirement that non-point load reductions acquired for the purpose of offsetting nutrient discharges be enforced through the individual VPDES permit.

j. E3/E4. 9VAC25-40-70.B. authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

k. Nutrient Reopener. 9VAC25-40-70.A. authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390.A. authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

l. TMDL Reopener. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL that may be developed and approved for the receiving stream.

22. Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

a. Special Conditions:

- The Nutrient Reopener was added with this reissuance.
- The Reuse Regulations Reopener was removed with this reissuance since it is no longer valid.
- The Water Quality Criteria Reopener was removed with this reissuance.

b. Monitoring and Effluent Limitations:

- The 0.75 MGD rerating was removed with this reissuance.
- Dissolved Oxygen minimum limit was changed from 3.0 mg/L to 5.0 mg/L to reflect the current VPDES Permit Manual.
- Total Phosphorus limits were changed from 0.50 mg/L and 0.30mg/L to 0.13 mg/L and 0.07 mg/L at the 1.5 MGD and 3.0 MGD design flows, respectively, to reflect the off-set plan submitted by Caroline County to meet their WLA (see Section 17.e for discussion).
- The monitoring frequency for chronic toxicity at the expanded flows was changed to 1/Q to reflect agency guidance.
- The reporting requirement for the phosphorus monthly average loading was removed with this reissuance.

c. Other:

- The permit status for this facility was changed from minor to major due to the expansion flow tiers and the approved pre-treatment program per the current VPDES Permit Manual.
- The drainage area and river mile information was updated based on the Planning Statement.

24. Variances/Alternate Limits or Conditions: Not applicable

25. Public Notice Information:

First Public Notice Date: TBD 2012 Second Public Notice Date: TBD 2012

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193; Telephone No. (703) 583-3873; Douglas.Frasier@deq.virginia.gov. See **Attachment 11** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action and may request a public hearing during the comment period. Comments shall include the name, address and telephone number of the writer and of all persons represented by the commenter/requester and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. 303 (d) Listed Stream Segments and Total Max. Daily Loads (TMDL):
Polecat Creek has been listed as impaired for the Aquatic Life Use due to excursions for dissolved oxygen and pH with TMDLs expected in 2022 and 2016, respectively. If it is determined that the impairments are due to natural conditions, the TMDLs will not be required.

27. Additional Comments:

Previous Board Action(s): Not Applicable.

Staff Comments: No comments were received.

Public Comment: No comments were received during the public notice.

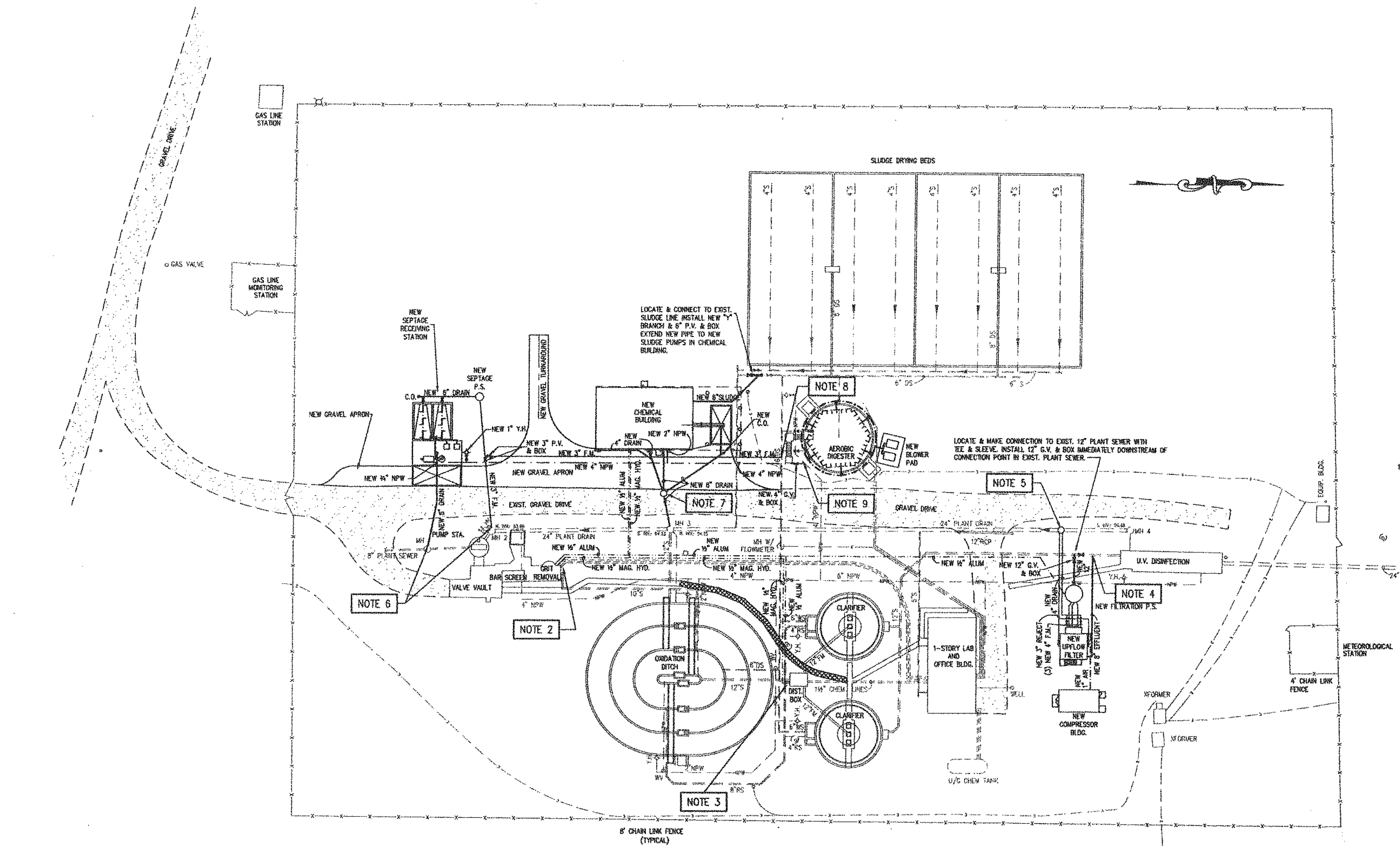
EPA Checklist: The checklist can be found in **Attachment 12**.

Fact Sheet Attachments

Table of Contents

Caroline County Regional Wastewater Treatment Plant
VA0073504
2012 Reissuance

Attachment 1	Facility Schematic/Diagram
Attachment 2	Certificate to Construct for 1.5 MGD facility
Attachment 3	Topographic Map
Attachment 4	Technical Inspection Summary
Attachment 5	Planning Statement
Attachment 6	Water Quality Criteria
Attachment 7	Ammonia Limitation Derivation
Attachment 8	Metal Limitation Derivations
Attachment 9	Off-Set Plan
Attachment 10	Whole Effluent Toxicity Test Summary
Attachment 11	Public Notice
Attachment 12	EPA Checklist



SYSTEM OUTFALL, 24" D.I.P. FLOWLINE ELEV. 102.97

PIPING NOTES

1. ALL NEW PIPING SHALL BE INSTALLED WITH MIN. 3.5' OF COVER, UNLESS SHOWN OTHERWISE ON PLANS.
2. RUN NEW ALUM. & MAG. HYD. PIPES TO EXIST. GRIT REMOVAL UNIT EFFLUENT CHANNEL. PIPING TO RUN UP OVER WALL, PROVIDE BALL VALVE, ELL. DOWN & TERMINATE AT ELEVATION 124.5. PIPING TO BE INSTALLED, HEAT TRACED & INSULATED FROM GRADE TO WHERE PIPING TURNS DOWN INTO TROUGH. UTILIZE EXIST. ELECTRICAL SERVICE FOR NEW HEAT TRACING.
3. RUN NEW ALUM. & MAG. HYD. PIPES TO EXIST. DIST. BOX INFLUENT COMPARTMENT. PIPING TO RUN UP OVER WALL, PROVIDE BALL VALVE, ELL. DOWN & TERMINATE AT ELEVATION 124.5. PIPING TO BE INSTALLED, HEAT TRACED & INSULATED FROM GRADE TO WHERE PIPING TURNS DOWN INTO COMPARTMENT. UTILIZE EXIST. ELECTRICAL SERVICE FOR NEW HEAT TRACING.
4. EXTEND PIPING FROM STRUCTURE TO EXISTING SEWER. MAINTAIN SLOPE FROM STRUCTURE TO SEWER. LOCATE & MAKE CONNECTION TO EXISTING SEWER WITH TEE & SLEEVE.
5. CONSTRUCT NEW MH OVER EXISTING SEWER EXTEND PIPING FROM STRUCTURE TO NEW MH & CONNECT. MAINTAIN SLOPE FROM STRUCTURE TO NEW MH.
6. EXTEND PIPING FROM STRUCTURE TO EXISTING MH. CORE EXISTING MH & SEAL WITH LINK SEAL. MAINTAIN SLOPE ON DRAIN PIPING FROM STRUCTURE TO MH.
7. CONSTRUCT NEW MH, RUN DRAIN PIPING FROM CHEMICAL BLDG., CHEMICAL SPILL PAD & TRUCK SLAB TO NEW MH. NEW MH INV. TO BE 110.00. EXTEND NEW 8" DRAIN PIPING FROM NEW MH TO EXISTING MH. MAINTAIN MIN. SLOPE OF 0.4% GRADE ON NEW 8" DRAIN. INVERTS OF NEW PIPES AT NEW MH SHALL BE, 6" FROM CHEMICAL BUILDING 111.50, 4" FROM CHEMICAL SPILL PAD 110.50, 8" FROM TRUCK SLAB 110.50.
8. LOCATE EXISTING SLUDGE LINE AND CONNECT NEW 3" F.M. FROM NEW SEPTAGE P.S. TO EXISTING SLUDGE LINE.
9. LOCATE EXISTING NPW LINE AND CONNECT NEW 4" NPW LINE.
10. ALL NEW ALUM & MAG. HYD. LINES SHALL HAVE DUPLICATE LINES RUN FOR FUTURE USE. THE DUPLICATE LINES SHALL EXTEND INTO NEW CHEMICAL BUILDING AND BE CAPPED FOR FUTURE CONNECTION. THE DUPLICATE LINES SHALL FOLLOW EACH NEW CHEMICAL LINE TO THE POINT OF DISCHARGE, PROVIDE BALL VALVE AND TERMINATE AT THE POINT OF DISCHARGE WITH A REMOVABLE CAP. THE DUPLICATE LINES DO NOT REQUIRE HEAT TRACE.

NOTE:
THE EXACT LOCATION & SIZE OF UNDERGROUND UTILITIES IS UNKNOWN. UNDERGROUND UTILITIES, IN ADDITION TO THOSE SHOWN, MAY EXIST. CONTRACTOR SHALL VERIFY BEFORE STARTING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONFLICTS IMMEDIATELY.

PIPING LEGEND

- NEW AIR PIPING
- EXIST. CHEMICAL LINE
- NEW CHEMICAL LINE
- EXIST. DIGESTED SLUDGE
- EXIST. NON-POTABLE WATER
- NEW NON-POTABLE WATER
- EXIST. PLANT DRAIN
- EXIST. PLANT SEWER
- NEW PLANT SEWER
- EXIST. RETURN SLUDGE
- EXIST. SANITARY FORCE MAIN
- EXIST. U/G TELEPHONE
- EXIST. WASTE SLUDGE
- EXIST WATER
- EXIST. U/G ELECTRIC

REV. NO.	DATE	DESCRIPTION	BY
3	9-11-00	GENERAL REVISIONS	L.G.G.
2	4-18-00	GENERAL REVISIONS	L.G.G.
1	4-6-00	GENERAL REVISIONS	L.L.S.

REVISIONS

COMMONWEALTH OF VIRGINIA
GARY ALAN WEISHAAR
No. 8219
01/09/01
PROFESSIONAL ENGINEER

R. STUART ROYER & ASSOCIATES, INC.
CONSULTING ENGINEERS
RICHMOND, VIRGINIA

CAROLINE COUNTY, VIRGINIA
REGIONAL WASTEWATER TREATMENT
PLANT UPGRADE

PIPING PLAN

DATE: DECEMBER 1999
SCALE: 1" = 30'
DESIGNED: W.L.R.
DRAWN: L.L.S.
CHECKED: H.W.

DRAWING NO. 9915

C-3 OF 30 SHEETS

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

July 27, 2011

Caroline County
Caroline Co Regional WWTP Expansion and Upgrade
PTL#25326, VA0073504

Mr. Joseph Schiebel
Director, Caroline Co Dept of Public Utilities
233 W. Broaddus Ave
PO Box 424
Bowling Green, VA 22427

Dear Mr. Schiebel:

In accordance with the Code of Virginia, Title 62.1, Section 62.1-44.19, attached please find the Certificate to Construct (CTC) for this project. This CTC is being issued based on the Application for Certificate to Construct dated June 29, 2011, and received by this office on July 11, 2011.

Receipt of this CTC does not relieve any owner of the responsibility to comply with any other applicable statutes or regulations, including local ordinances and zoning requirements.

Please be advised that a Certificate to Operate (CTO) is required by the Code before placing the system in operation. Application for the CTO can be found at the DEQ website:
http://www.deq.virginia.gov/wastewater/MunicipalNonWQIFProcedures032010 .

If you have any questions about this letter or the approval process, please contact me at (703)-583-3834 or alison.thompson@deq.virginia.gov.

Respectfully,

Alison Thompson
Water Permits Technical Reviewer

cc: VA0073504 Permit File
VDH District Office, attn: Environmental Health Manager
Caroline County Building Official
Wade Tanner, Reid Engineering Company, 1210 Princess Anne St, Fredericksburg, VA 22401

Attachment: CTC

Virginia Department of Environmental Quality
APPLICATION for CERTIFICATE TO CONSTRUCT (CTC)
For Municipal Sewage Collection, Treatment, and/or Reclamation Systems

See Instructions. Do not submit plans and specifications. Submit 1 copy of this form with all attachments. Form will expand as you enter information.

Project Title: (as it appears on plans) **FER:** Caroline County Regional Wastewater Treatment Plant Expansion and Upgrade – Upper Polecat Creek Facility P.E. Seal Date on Cover: Wade Tanner, PE, June 29, 2011 Specifications Title and Date: N/A	
Location of Project: Caroline County	County/City: Caroline County
Receiving Wastewater Collection System(s): n/a	
Receiving Sewage Treatment Plant(s)/Reclamation System: Upper Polecat Creek Wastewater Treatment Plant	
PROJECT OWNER: Caroline County	**PROJECT ENGINEER**
Owner Contact Name: Joseph Schiebel	Name: Wade Tanner
Title: Director, Dept of Public Utilities	Company Name: Reid Engineering Company
Address: 233 W. Broaddus Ave PO Box 424 Bowling Green, VA 22427	Address: 1210 Princess Anne Street Fredericksburg, VA 22401
Phone: 804-633-4390	Phone: 540-371-8500
Email: jschiebel@co.county.va.us	Email: wtanner@reidengineering.com
Owner Signature and date:	

For Sewage Treatment Works and Sewage Collection Systems:

Attach Project Description

Attach Letter(s) of Acceptance from Receiving Facility/Utility for sewage collection system projects

Attach Reliability Class: (1) For Pump Stations attach Reliability Class Worksheet. (2) For Sewage Treatment Plants note the Reliability Class rating from the VPDES or VPA permit and method of meeting reliability classification requirements.

For a sewage treatment plant project, provide the VPDES or VPA permit number: 0073504

Design Sewage Flow (Sewage Plant): (a) average daily flow (MGD): 1.5 (b) peak daily flow (MGD): 3.0

Design Sewage Flow (Pump Station): (a) average daily flow (MGD): _____ (b) peak hour flow (MGD): _____

Please check the appropriate components of your project:

Gravity and/or Vacuum Sewer	☐	New Sewage Treatment Plant	☐
Pump Station(s)	☐	Modification of Existing Sewage Treatment Plant	☒
Force Main(s)	☐	Expansion of Existing Sewage Treatment Plant	☒

For Reclamation or Satellite Reclamation System, Attach Page 2: Page 2 Attached? Yes ☐ No ☐

The following statement must be signed and sealed by the Virginia licensed design engineer:

"As discussed in 9 VAC 25-790-240.C., the referenced design documents are in substantial compliance with Part III - Manual of Practice For Sewerage Systems and Treatment Works of the Sewage Collection and Treatment Regulations (9 VAC 25-790-310 et seq.)"

COMMONWEALTH OF VIRGINIA
WADE H. TANNER
Lic. No. 039043
6-29-11
PROFESSIONAL ENGINEER

Licensed Design Engineer's Signature and original seal (signed and dated)

☐ **Design exceptions and justifications are attached in accordance with 9 VAC 25-790-240.C.**

For DEQ use only:

In accordance with the *Code of Virginia* 1950, as amended, Title 62.1, Section 62.1-44.19, this form, signed by the appropriate DEQ representative, constitutes your Certificate to Construct. This Certificate is valid for a period of five years from the date of issuance. Other permits and authorizations may be necessary. Please contact your Regional DEQ Office if you have any questions.

Name	Signature	Date	CTC PTL Number
Alison Thompson		7/27/11	25326

Department of Environmental Quality Authorized Representative

Note: Once the project is complete, an application for a Certificate to Operate must be submitted to the appropriate DEQ Regional office.

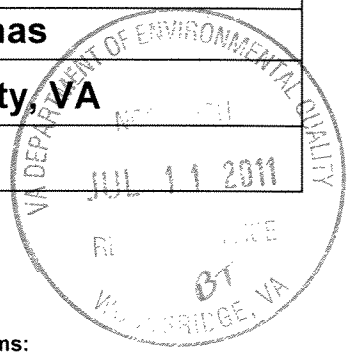
REID ENGINEERING COMPANY, INC.
1210 Princess Anne Street
Fredericksburg, VA 22401

Tele: 540/371-8500 Fax: 540/371-8576
e-mail: wtanner@reidengineering.com

Protecting the Environment and Your Investment in Pollution Control

LETTER OF TRANSMITTAL

DATE: July 8, 2011	JOB NO.: CR01a
TO: **Mr. Bryant Thomas**	
RE: Caroline County, VA	



Virginia DEQ

WE ARE SENDING YOU: Attached Under separate cover via _the following items:

Drawings Prints Plans Samples Specifications

Copy of Letter Change Order Submittal

COPIES	DATE	No.	DESCRIPTION
1	7/8/11		Certificate to Construct

THESE ARE TRANSMITTED as check below:

For approval Approved as Submitted Resubmit ___ copies for approval

For your Use Approved as Noted Submit ___ copies for distribution

Change Order Returned for corrections Return ___ corrected prints

For review and comment

FOR BIDS DUE _____ 20__ PRINTS RETURNED AFTER LOAN TO US

REMARKS:
Please call if you have any questions.

COPY: File SIGNATURE: **Wade Tanner, P.E. / rs**

Reid Engineering Company, Inc.

Environmental and Civil Engineering Consultants
• Wastewater • Water /Sewer • Reuse
1210 Princess Anne Street | Fredericksburg, Virginia 22401
540-371-8500 | www.reidengineering.com

July 7, 2011

Mr. Bryant Thomas
Water Permits Division
Virginia Department of Environmental Quality (DEQ)
13901 Crown Court
Woodbridge, VA 22193

SUBJECT: **CERTIFICATE TO CONSTRUCT (CTC) for CAROLINE COUNTY WASTEWATER TREATMENT PLANT EXPANSION & UPGRADE– UPPER POLECAT CREEK FACILITY**

Dear Mr. Bryant:

On behalf of Caroline County, Reid Engineering Company, has prepared the Application for Certificate to Construct (CTC) for the Expansion and Upgrade to the existing Upper Polecat Creek Wastewater Treatment Facility. The existing discharge permit number for the facility is VA 0073504. The existing WWTP is has a design capacity of 0.50 MGD and Caroline County desires to expand the treatment capacity to 1.50 MGD with this application. The project is a design build PPEA project and we request for CTC approval based on the preparation of a Final Engineering Report "FER" dated June 29, 2011.

To expand the wastewater treatment capacity from 0.50 MGD to 1.50 MGD and comply with the requirements of the existing permit, a new five-stage Bardenpho activated sludge treatment process followed by tertiary dentrification filters and UV disinfection is proposed with this application.

Please find the enclosed information for your use to obtain approval of the CTC for the project:

- Application for Certificate to Construct (CTC)
- Project Description
- Reliability Classification Requirements

If you have questions or need additional information please let our office know at your earliest convenience. You may contact me at 540-371-8500.

Sincerely,

Wade Tanner
Project Manager

cc: Joey Schiebel, Caroline County (electronic)
Mike Baldwin, MEB (electronic)

Reid Engineering Company, Inc.

Environmental and Civil Engineering Consultants
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CTC APPLICATION ATTACHMENT
CAROLINE COUNTY WASTEWATER TREATMENT PLANT EXPANSION & UPGRADE – UPPER POLECAT CREEK FACILITY

PROJECT DESCRIPTION:

The existing Caroline County Regional Wastewater Treatment Plant (CCRWTP) is permitted for a flow capacities from 500,000 gallons/day up to 3,000,000 gallons/day under discharge permit #VA0073504. The existing Wastewater Treatment Plant has a design capacity of 500,000 gallons/day. The County desires to expand the capacity of this wastewater treatment plant to 1.5 MGD initially and ultimately to 3.0 MGD. Permit limits for Annual Total Nitrogen (TN) and Total Phosphorus (TP) were included in the discharge permit issued by the Virginia DEQ effective June 18, 2007 through June 17, 2012. The new Annual TN and TP Allocation Limits are part of the Chesapeake Bay nutrient reduction initiative.

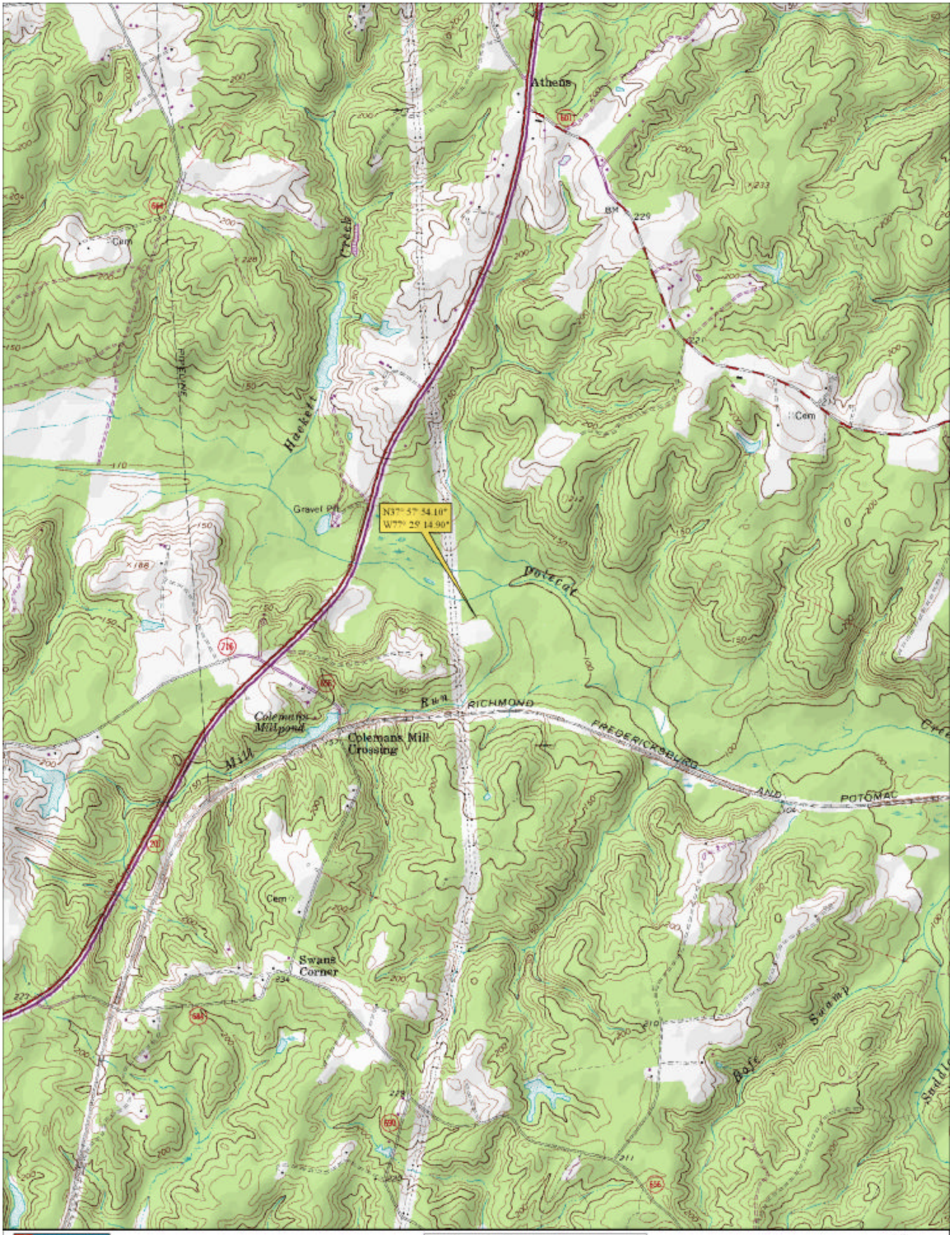
The CCRWTP is located at 22101 Rogers Clark Boulevard, Ruther Glen, Virginia on the existing wastewater treatment plant site and discharges directly to Polecat Creek, a tributary of the York River Basin which is part of the Chesapeake Bay Watershed. Therefore, the new CCRWTP is subject to the 9 VAC 25-720 Water Quality Management Planning Regulation which requires significant dischargers to comply with certain waste load allocations for nitrogen and phosphorus. The waste load allocations for Total Nitrogen (TN) and Total Phosphorus (TP) are 9,137 lbs/year and 1,066 lbs TP/year, respectively.

To comply with the requirements of VPDES #VA0073504 for the CCRWTP, a five-stage Bardenpho activated sludge process will be constructed. The upgraded CCRWTP will consist of the following major treatment system components:

- Raw Wastewater Pump Station
- Mechanical Screening
- Grit Removal System
- Flow Equalization Basin Anaerobic Reactor #1
- Flow Equalization Basin Anoxic Reactor #2
- Nitrification Reactors #3A & #3B
- Anoxic Reactors #4A & #4B
- Aerobic Reactors #5A & #5B
- Final Clarifiers #1 and #2
- Tertiary Denitrification Filtration System
- UV Disinfection System
- Post Aeration Cascade
- Aerobic Sludge Digestion
- Sludge Dewatering System

RELIABLITY CLASS:

The reliability classification for the existing plant is Reliability Class I. The reliability classification requirements will be satisfied by providing a dual power feed from two separate and independent power sources.



Technical Inspection Summary

Comments/Recommendations from last inspection on November 5, 2007

- **Please provide DEQ with updated connected and population served numbers. Information not received as of March 16, 2011.**

Comments/Recommendations for Action from the Current Inspection on February 15, 2011:

- **Please provide DEQ with updated connected and population served numbers. Information not received as of March 16, 2011.**
- **The cross connection control device was last inspected in May 2007. DEQ recommends all potable water service lines be inspected annually.**
- **Excessive floating debris was noted in the oxidation ditch. Debris has carried over into other unit processes (Clarifier and Sand Filter). The excessive floating debris has the potential to clog the pumps sending activated sludge into the clarifier. Photos 4 & 5**
- **Debris from oxidation ditch carried over into the clarifier. The clarifier effluent weirs were covered in debris and some algae. Photos 8, 9, 10 and 11. The clarifier effluent contained floating debris and was carried over into the sand filter unit.**
- **Wasted sludge is aerobically digested for approximately 20-30 days prior to being dewatered via a belt filter press. The facility does not digest to Class B Standards. The sludge is transported to the BFI Old Dominion Landfill located at 2001 Charles City Road, Richmond, VA for final disposal.**
- **Debris from aerobic digester was carried over into the dried sludge in the drying beds.**
- **Caroline Co. staff shall evaluate the breakdown of process control equipment to determine how debris is allowed to "pass-thru" downstream process units and end up in the dewatered sludge to the extent observed during the inspection and noted in Photo 22. This evaluation and plan of action for resolving this problem shall be reduced to a written report and submitted to DEQ-NRO staff by April 29, 2011.**
- **Caroline Regional staff has obtained interim certification through VELAP to analyze permit required parameters. The internal audit of the laboratory has not been conducted as of February 15, 2011.**

To: Douglas Frasier
From: Jennifer Carlson

Date: January 5, 2012
Subject: Planning Statement for Caroline County Regional WWTP
Permit No: VA0073504

Discharge Type: major municipal
Discharge Flow: 0.50 MGD up to 3.0 MGD

Receiving Stream: Polecat Creek
Latitude / Longitude: 37° 57' 54.1? / 77° 25' 14.9?
Streamcode: 8-PCT
Waterbody: VAN-F20R
WQ Standards: Class III, Section 3
Rivermile: 5.92
Drainage Area: 34.3 mi^2

1. Is there monitoring data for the receiving stream?

   Yes, there is monitoring data for Polecat Creek. DEQ ambient monitoring station 8-PCT002.29 is located at the Route 601 bridge crossing, approximately 3.6 miles downstream of Outfall 001.

   - If yes, please attach latest summary.

   The following is the summary for this segment of Polecat Creek, as taken from the 2010 Integrated Report:

   Class III, Section 3.

   DEQ ambient monitoring stations 8-PCT002.29, at Route 601, and 8-PCT006.34, at Route 207.

   Ambient monitoring finds pH and dissolved oxygen impairments, resulting in an impaired classification for the aquatic life use. The pH and dissolved oxygen excursions may be attributable to natural conditions as this segment is a low-lying Coastal Plain environment with no riffles and slow moving pools that are subject to low pH and DO. The wildlife and recreation uses are considered fully supporting. The fish consumption use was not assessed.

   - If no, where is the nearest downstream monitoring station.

2. Is the receiving stream on the current 303(d) list?

Yes, Polecat Creek is listed with two impairments

- If yes, what is the impairment?

Aquatic Life Use – Dissolved Oxygen: Sufficient excursions below the minimum dissolved oxygen criterion (3 of 27 samples - 11.1%) were recorded at DEQ's ambient water quality monitoring station (8-PCT002.29) at the Route 601 crossing to assess this stream segment as not supporting the aquatic life use goal for the 2010 water quality assessment.

Aquatic Life Use – pH: Sufficient excursions below the lower limit of the pH criterion range (7 of 27 samples - 25.9%) were recorded at DEQ's ambient water quality monitoring station (8-PCT002.29) at the Route 601 crossing and (3 of 11 - 27.3%) at DEQ's ambient water quality monitoring station (8-PCT006.34) at the Route 207 crossing to assess this stream segment as not supporting the aquatic life use goal for the 2010 water quality assessment.

- Has the TMDL been prepared?

No.

- If yes, what is the WLA for the discharge?

N/A

- If no, what is the schedule for the TMDL?

The dissolved oxygen TMDL is due by 2022, and the pH TMDL is due by 2016. However, a Natural Conditions Assessment Report will be completed for Polecat Creek. The purpose of this study is to determine whether the causes of the impairments are due to the natural environment or due to anthropogenic effects. If the natural conditions are determined to be contributing to the impairment, the TMDLs will not be required.

3. If the answer to (2) above is no, is there a downstream 303(d) listed impairment? N/A

- If yes, what is the impairment? N/A

- Has a TMDL been prepared? N/A

- Will the TMDL include the receiving stream? N/A

- Is there a WLA for the discharge? N/A

- What is the schedule for the TMDL? N/A

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

   There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

5. Fact Sheet Requirements – Please provide information on other VPDES permits or VADEQ monitoring stations located within a 2 mile radius of the facility. In addition, please provide information on any drinking water intakes located within a 5 mile radius of the facility.

   There are no public water supply intakes located within a 5 mile radius of the facility.

   There are no VPDES permitted facilities, and only the 2 following DEQ monitoring stations located within a 2 mile radius:

   8-PCT006.34 - on Polecat Creek, about 0.5 miles upstream of Outfall 001
   8-PCT007.71 - on Polecat Creek, about 1.8 miles upstream of Outfall 001

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Caroline County Regional WWTP Permit No.: VA0073504

Receiving Stream: Polecat Creek, UT Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	0	mg/L
90% Temperature (Annual) =	0	deg C
90% Temperature (Wet season) =	0	deg C
90% Maximum pH =	0	SU
10% Maximum pH =	0	SU
Tier Designation (1 or 2) =	1	
Public Water Supply (PWS) Y/N? =	n	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows

1Q10 (Annual) =	0	MGD
7Q10 (Annual) =	0	MGD
30Q10 (Annual) =	0	MGD
1Q10 (Wet season) =	0	MGD
30Q10 (Wet season)	0	MGD
30Q5 =	0	MGD
Harmonic Mean =	0	MGD

Mixing Information

Annual - 1Q10 Mix =	0	%
- 7Q10 Mix =	0	%
- 30Q10 Mix =	0	%
Wet Season - 1Q10 Mix =	0	%
- 30Q10 Mix =	0	%

Effluent Information

Mean Hardness (as CaCO3) =	94	mg/L
90% Temp (Annual) =	25	deg C
90% Temp (Wet season) =	15	deg C
90% Maximum pH =	7.9	SU
10% Maximum pH =	7.6	SU
Discharge Flow =	3	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	5	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	na	**9.9E+02**
Acrolein	0	--	--	na	9.3E+00	--	--	na	9.3E+00	--	--	--	--	--	--	--	--	--	--	na	**9.3E+00**
Acrylonitrile [C]	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	na	**2.5E+00**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	3.0E+00	--	na	5.0E-04	--	--	--	--	--	--	--	--	**3.0E+00**	--	na	**5.0E-04**
Ammonia-N (mg/l) (Yearly)	0	1.01E+01	1.42E+00	na	--	1.01E+01	1.42E+00	na	--	--	--	--	--	--	--	--	--	**1.01E+01**	**1.42E+00**	na	**--**
Ammonia-N (mg/l) (High Flow)	0	1.01E+01	2.71E+00	na	--	1.01E+01	2.71E+00	na	--	--	--	--	--	--	--	--	--	**1.01E+01**	**2.71E+00**	na	**--**
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.0E+04	--	--	--	--	--	--	--	--	--	--	na	**4.0E+04**
Antimony	0	--	--	na	6.4E+02	--	--	na	6.4E+02	--	--	--	--	--	--	--	--	--	--	na	**6.4E+02**
Arsenic	o	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	**3.4E+02**	**1.5E+02**	na	**--**
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	--	--	--	--	na	**5.1E+02**
Benzidine [C]	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	--	--	--	--	na	**2.0E-03**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	**1.8E-01**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	**1.8E-01**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	**1.8E-01**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	**1.8E-01**
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	**5.3E+00**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	6.5E+04	--	--	--	--	--	--	--	--	--	--	na	**6.5E+04**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	--	--	--	--	na	**2.2E+01**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	**1.4E+03**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	**1.9E+03**
Cadmium	0	3.7E+00	1.1E+00	na	--	3.7E+00	1.1E+00	na	--	--	--	--	--	--	--	--	--	**3.7E+00**	**1.1E+00**	na	**--**
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	--	--	na	**1.6E+01**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	8.1E-03	--	--	--	--	--	--	--	--	**2.4E+00**	**4.3E-03**	na	**8.1E-03**
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	**8.6E+05**	**2.3E+05**	na	**--**
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	**1.9E+01**	**1.1E+01**	na	**--**
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	**1.6E+03**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	na	1.3E+02
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+03
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	--	--	8.3E-02	4.1E-02	na	--
Chromium III	0	5.4E+02	7.0E+01	na	--	5.4E+02	7.0E+01	na	--	--	--	--	--	--	--	--	--	5.4E+02	7.0E+01	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.6E+01	1.1E+01	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	--	--	--	--	na	1.8E-02
Copper	0	1.3E+01	8.5E+00	na	--	1.3E+01	8.5E+00	na	--	--	--	--	--	--	--	--	--	1.3E+01	8.5E+00	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	--	--	--	--	--	--	--	--	2.2E+01	5.2E+00	na	1.6E+04
DDD [C]	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	--	--	--	--	na	3.1E-03
DDE [C]	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	--	--	--	--	na	2.2E-03
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	--	--	--	--	--	--	--	--	1.1E+00	1.0E-03	na	2.2E-03
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	--	--	--	--	--	--	--	--	1.7E-01	1.7E-01	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	--	--	na	1.3E+03
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	9.6E+02	--	--	--	--	--	--	--	--	--	--	na	9.6E+02
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.9E+02	--	--	--	--	--	--	--	--	--	--	na	1.9E+02
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	--	--	--	--	na	2.8E-01
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	1.7E+02
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	3.7E+02
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	7.1E+03	--	--	--	--	--	--	--	--	--	--	na	7.1E+03
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	--	--	na	1.0E+04
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.9E+02	--	--	--	--	--	--	--	--	--	--	na	2.9E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+02
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	--	--	--	--	na	2.1E+02
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	--	--	--	--	--	--	--	--	2.4E-01	5.6E-02	na	5.4E-04
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	4.4E+04	--	--	--	--	--	--	--	--	--	--	na	4.4E+04
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	8.5E+02	--	--	--	--	--	--	--	--	--	--	na	8.5E+02
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.1E+06	--	--	--	--	--	--	--	--	--	--	na	1.1E+06
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	4.5E+03	--	--	--	--	--	--	--	--	--	--	na	4.5E+03
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.8E+02	--	--	--	--	--	--	--	--	--	--	na	2.8E+02
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	--	--	--	--	na	3.4E+01
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	5.1E-08	--	--	--	--	--	--	--	--	--	--	na	5.1E-08
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	--	--	--	--	na	2.0E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	8.9E+01
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	8.9E+01
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	--	--	na	8.9E+01
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	--	--	--	--	--	--	--	--	8.6E-02	3.6E-02	na	6.0E-02
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.0E-01	--	--	--	--	--	--	--	--	--	--	na	3.0E-01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.1E+03	--	--	--	--	--	--	--	--	--	--	na	**2.1E+03**
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	--	--	na	**1.4E+02**
Fluorene	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	**5.3E+03**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	**--**
Heptachlor [c]	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	**7.9E-04**
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	**3.9E-04**
Hexachlorobenzene[c]	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	**2.9E-03**
Hexachlorobutadiene[c]	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	**1.8E+02**
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	**4.9E-02**
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	**1.7E-01**
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	na	na	1.8E+00	9.5E-01	--	na	1.8E+00	--	--	--	--	--	--	--	--	9.5E-01	--	na	**1.8E+00**
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	**1.1E+03**
Hexachloroethane[c]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	**3.3E+01**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	**--**
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	**1.8E-01**
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Isophorone[c]	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	**9.6E+03**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	**--**
Lead	0	1.1E+02	1.2E+01	na	--	1.1E+02	1.2E+01	na	--	--	--	--	--	--	--	--	--	1.1E+02	1.2E+01	na	**--**
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	**--**
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Mercury	0	1.4E+00	7.7E-01	- -	- -	1.4E+00	7.7E-01	- -	- -	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	- -	**- -**
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	**1.5E+03**
Methylene Chloride [c]	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	**5.9E+03**
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	**--**
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	**--**
Nickel	0	1.7E+02	1.9E+01	na	4.6E+03	1.7E+02	1.9E+01	na	4.6E+03	--	--	--	--	--	--	--	--	1.7E+02	1.9E+01	na	**4.6E+03**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	6.9E+02	--	--	--	--	--	--	--	--	--	--	na	**6.9E+02**
N-Nitrosodimethylamine[c]	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	**3.0E+01**
N-Nitrosodiphenylamine[c]	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	**6.0E+01**
N-Nitrosodi-n-propylamine[c]	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	**5.1E+00**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	na	--	--	--	--	--	--	--	--	--	2.8E+01	6.6E+00	na	**--**
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	**--**
PCB Total[c]	0	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	--	--	--	--	--	--	--	--	1.4E-02	na	**6.4E-04**
Pentachlorophenol [c]	0	1.6E+01	1.2E+01	na	3.0E+01	1.6E+01	1.2E+01	na	3.0E+01	--	--	--	--	--	--	--	--	1.6E+01	1.2E+01	na	**3.0E+01**
Phenol	0	--	--	na	8.6E+05	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	--	--	na	**8.6E+05**
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	**4.0E+03**
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.2E+03	--	--	--	--	--	--	--	--	**2.0E+01**	**5.0E+00**	**na**	**4.2E+03**
Silver	0	3.1E+00	--	na	--	3.1E+00	--	na	--	--	--	--	--	--	--	--	--	**3.1E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.0E+01**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+01**
Thallium	0	--	--	na	4.7E-01	--	--	na	4.7E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E-01**
Toluene	0	--	--	na	6.0E+03	--	--	na	6.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.0E+03**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	2.8E-03	--	--	--	--	--	--	--	--	**7.3E-01**	**2.0E-04**	**na**	**2.8E-03**
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	--	--	--	--	**4.6E-01**	**7.2E-02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.0E+01**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+02**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.0E+02**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+01**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+01**
Zinc	0	1.1E+02	1.1E+02	na	2.6E+04	1.1E+02	1.1E+02	na	2.6E+04	--	--	--	--	--	--	--	--	**1.1E+02**	**1.1E+02**	**na**	**2.6E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	6.4E+02
Arsenic	9.0E+01
Barium	na
Cadmium	6.5E-01
Chromium III	4.2E+01
Chromium VI	6.4E+00
Copper	5.1E+00
Iron	na
Lead	7.5E+00
Manganese	na
Mercury	4.6E-01
Nickel	1.2E+01
Selenium	3.0E+00
Silver	1.2E+00
Zinc	4.4E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

2/9/2012 4:31:50 PM

Facility = Caroline County Regional WWTP
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 10.1
WLAc = 1.4
Q.L. = 0.1
# samples/mo. = 12
# samples/wk. = 3

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 2.82473813078283
Average Weekly limit = 2.06613690968962
Average Monthly LImit = 1.53900194406496

The data are:

9

2/9/2012 4:31:06 PM

Facility = Caroline County Regional WWTP
Chemical = Cadmium
Chronic averaging period = 4
WLAa = 3.7
WLAc = 1.1
Q.L. = 0.65
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = .603036
Variance = .130915
C.V. = 0.6
97th percentile daily values = 1.46744
97th percentile 4 day average = 1.00332
97th percentile 30 day average= .727294
< Q.L. = 2
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
0
1.3

2/9/2012 4:30:11 PM

Facility = Caroline County Regional WWTP
Chemical = Copper
Chronic averaging period = 4
WLAa = 13
WLAc = 8.5
Q.L. = 1.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 8
Expected Value = 1.69513
Variance = 1.03445
C.V. = 0.6
97th percentile daily values = 4.12496
97th percentile 4 day average = 2.82034
97th percentile 30 day average= 2.04442
< Q.L. = 2
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

2.6
8.7
3.4
10
1.6
7.2
0
0

2/9/2012 4:25:01 PM

Facility = Caroline County Regional WWTP
Chemical = Nickel
Chronic averaging period = 4
WLAa = 170
WLAc = 19
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 7.44178
Variance = 19.9368
C.V. = 0.6
97th percentile daily values = 18.1089
97th percentile 4 day average = 12.3815
97th percentile 30 day average= 8.97518
< Q.L. = 1
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

6.5
0
10

2/9/2012 4:27:05 PM

Facility = Caroline County Regional WWTP
Chemical = Zinc
Chronic averaging period = 4
WLAa = 110
WLAc = 110
Q.L. = 44
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 22
Expected Value = 45.2308
Variance = 736.500
C.V. = 0.6
97th percentile daily values = 110.065
97th percentile 4 day average = 75.2547
97th percentile 30 day average= 54.5508
< Q.L. = 13
Model used = BPJ Assumptions, Type 1 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 110
Average Weekly limit = 110
Average Monthly LImit = 110

The data are:

26
40
38
40
50
30
50
60
53
43
58
58
68
49
69
0
0
0
0
0

County of Caroline
Joseph C. Schiebel
Interim Director
Public Utilities
233 West Broaddus Avenue
P.O. Box 424
Bowling Green, Virginia 22427
(804) 633-4390 Main
(804) 633-1190 Fax
E-mail: jschiebel@co.caroline.va.us

January 26, 2012

Allan Brockenbrough, II, P.E.
VADEQ Environmental Specialist II
P.O. Box 10009
Richmond, VA 23240

Subject: Off-Set Plan for Caroline County, VA Polecat Creek Regional Wastewater Treatment Plant

Dear Mr. Brockenbough,

The County's Waste Load Allocation under the current permit is based on a flow of 0.5 MGD and is as follows:

TN = 9,137 lbs/yr = 6 mg/l and TP = 1,066 lbs/yr = 0.7 mg/l

It is our there was a Watershed Implementation Plan under consideration for the York River that included Caroline County that required a lower Total Phosphorus (TP) WLA of 609 lbs/yr or TP = 0.4 mg/l down from 0.7 mg/l. These lower Phosphorus limits have not been considered in our Wastewater Treatment Plant upgrade planning to date.

The following table shows the calculated limits based on the various flows and WLA's:

WLA TN=9,137 lbs/yr and TP = 1,066 lbs/yr

Flow	TN	TP
MGD	mg/l	mg/l
0.5	6	0.7
0.875	3.43	0.4
1	3	0.35
1.25	2.4	0.28
1.5	2	0.23

WLA TN=9,137 lbs/yr and TP = 609 lbs/yr

Flow	TN	TP
MGD	mg/l	mg/l
0.5	6	0.4
0.875	3.43	0.23
1	3	0.20
1.25	2.4	0.16
1.5	2	0.133

The County has pursed a PPEA to design and build the 1.5 MGD expansion for future growth as the existing facility is nearing its capacity. This facility design incorporates a 5 Stage Bardenpho Reactor System followed by Upflow Denitrification filters along with Clarification, Sludge Handling, and UV Disinfection. The objective of the design is to provide treatment that is beyond what is considered by VADEQ as "State of the Art" technology so the County can meet limits as mentioned above. In addition, the County has also prepared a Reuse Plan as a potential option for future nutrient offsets.

The County does not anticipate exceeding 1.0 MGD in the short term of 5 years based on the most recent flow projects therefore, no offset plan is required. The flows are as follows:

	2012	2013	2014	2015	2016
Designed Flow (mgd)	0.50	0.50	1.50	1.50	1.50
Projected Flow (mgd) (Annual average)	0.36	0.38	0.40	0.42	0.45

In the long term of 10 years the County does anticipate to exceed the 1.0 MGD flow based on potential commercial and residential growth. The County has anticipated this and has performed a detailed Reuse Study which is attached. The County intends on showing the DEQ that the designed plant will meet the limits set forth in the tables but will use Reuse to offset nutrients if required.

We appreciate your assistance in this matter and look forward to working closely with you on this project as time is of the essence.

Please feel free to contact me at (804) 633-4390, if you have any questions.

Sincerely,

Joseph C. Schiebel
Caroline County
Interim Director of Public Utilities

Caroline County, VA
All-America City
2009

7. WWTP Discharge Offset Facilities

7.1 Purpose of Reuse Facilities

In reviewing the existing permit limits, the current nutrient wasteload allocation for the Caroline County Regional WWTP is 6 mg/l total nitrogen and 0.7 mg/l total phosphorous at a design flow of 0.5 mgd. Using the best available technology for treatment processes, a nutrient target of 3.5 mg/l total nitrogen and 0.2 mg/l of total phosphorous may be achieved with an upgraded facility. At the current facility location, the County's nutrient allocation would allow a discharge of 0.857 mgd. Although additional nutrient allocations for discharge of nutrients to the receiving stream have been requested, there is currently not any assurances that the request will be granted. Therefore, the evaluation of discharge offset (reuse) facilities is being included in this PER. If the additional nutrient allocations are granted, the reuse facilities may not be required.

7.2 Investigation of Potential Discharge Offset Facilities

Potential discharge offset (reuse) irrigation areas were investigated near the WWTP. It was assumed that large residential communities, golf courses, parks, and large commercial water users would express an interest in using reuse water for irrigation or washdown water. An inventory of potential reuse candidates is listed in Table 7-1. Approximately 6,400 homes, 580 acres of open space, and 185,000 gpd of commercial demand are potential reuse locations.

To calculate a reasonable reuse potential for large contiguous grassy areas, an irrigation rate of one inch of water per week (0.14 inch per day) was assumed. This irrigation rate is typical of irrigation rates in the service area.

It was assumed that residential development would use a similar irrigation rate as the rate used for open space. A typical residential lot size of 0.25 acres (or 10,890 square feet (SF)) was assumed. Available open space for irrigation was assumed to be the lot size less the footprint of a house (1,000 SF) and driveway (1,080 SF), yielding a usable spray area of 8,810 SF, or 0.2 acres per lot. The resulting estimated water needs for each residential lot was calculated to be 775 gallons/day/lot, or 3,880 gal/day/acre. The available residential lot area was multiplied by the 3,880 gal/day/acre to arrive at potential reuse rate. The calculated residential rates were added to the estimated golf course and commercial rates. Approximately 7.4 mgd of reuse potential was estimated for Caroline County. The results of this analysis are summarized in Table 7-2.

Table 7-1: Sources of Future Reuse Facilities

Description	Existing Homes / Land Area / Usage	Future Homes / Land Area / Usage	Total Potential
South River Subdivision	80 homes	300 homes	380 homes
Ladysmith Village	80 homes	2,500 homes	2,580 homes
Belmont Subdivision	381 homes	324 homes	705 homes
Pendleton Subdivision	300 homes	2,190 homes	2,490 homes
Bridlewood Subdivision	0 homes	221 homes	221 homes
Subtotal Residential Lots	841 homes	5,535 homes	6,376 homes
High School Park	10 acres		10 acres
Mattaponi Golf Course	114 acres		114 acres
Pendleton Golf Course	460 acres		460 acres
Sub-Total Large Spray Areas	584 acres		584 acres
Petro Truck Wash	50,000 gpd		50,000 gpd
Sports Complex	67,300 gpd	67,300 gpd	134,600 gpd
Sub-Total Commercial	117,300 gpd	67,300 gpd	184,600 gpd

Table 7-2: Summary of Total Potential Existing and Future Reuse Rates

Description	Existing Houses / Land Area / Usage	Future Houses / Land Area / Usage	Total Potential
South River Subdivision	62,000 gpd	232,500 gpd	294,500 gpd
Ladysmith Village	62,000 gpd	1,937,500 gpd	1,999,500 gpd
Belmont Subdivision	295,300 gpd	251,100 gpd	546,400 gpd
Pendleton Subdivision	232,500 gpd	1,697,300 gpd	1,929,800 gpd
Bridlewood Subdivision	0 gpd	171,300 gpd	171,300 gpd
Subtotal Residential Lots	651,800 gpd	4,289,700 gpd	4,941,500
High School Park	38,800 gpd		38,800 gpd
Mattaponi Golf Course	442,200 gpd		442,200 gpd
Pendleton Golf Course	1,784,200 gpd		1,784,200 gpd
Sub-Total Large Spray Areas	2,265,200 gpd		2,265,200 gpd
Petro Truck Wash	50,000 gpd		50,000 gpd
Sports Complex	67,300 gpd	67,300 gpd	134,600 gpd
Sub-Total Commercial	117,300 gpd	67,300 gpd	184,600 gpd
Total Reuse Potential	3,034,300 gpd	4,357,000 gpd	7,391,300 gpd

7.3 Analysis of Climatological Data

Climatological data was obtained from the National Weather Service for the closest recorded weather station in the area, Dulles International Airport. Previous year's data revealed that the rainfall at Dulles International Airport in 2005 was 44.5 inches. A normal rainfall rate since 1963 is 41.8 inches. As a comparison, the 30-year annual average rainfall for Richmond is 43.91 inches.

Each month was analyzed for the previous twelve-month period. Rain days were recorded when accumulation was equal to or greater than 0.1 inches of rainfall. It is assumed that any day showing rainfall of 0.1 inches or more was considered a day in which reuse irrigation would not be necessary. A total of 61 days had a rainfall accumulation of greater than 0.1 inches over the previous 12-month period. The irrigation season is typically the warm weather month of March through October (e.g. spring/summer/fall). The irrigation of grassy areas does not normally take place during colder months of November through February (e.g. winter). By eliminating the rain days during the winter period, 37 days remained in the eight summer months. Therefore, 37 rain days were subtracted from the irrigation season to account for natural rainfall, yielding 208 potential irrigation days. This data is provided in Table 7-3.

Table 7-3: Rainfall Greater Than or Equal to 0.1 inches/day (Recorded at Dulles International Airport)

Month	Year	Number of Days Greater than 0.1 inch Rainfall (12 month period)	Number of Days Greater than 0.1 inch Rainfall (warm weather months)[1]
June	2005	3	3
July	2005	8	8
August	2005	5	5
September	2005	1	1
October	2005	9	9
November	2005	5	n/a
December	2005	7	n/a
January	2006	7	n/a
February	2006	5	n/a
March	2006	0	0
April	2006	7	7
May	2006	4	4
Total rainfall days in 12 months		61 days	37 days

[1] Warm weather irrigation months are considered March through October.

This analysis concludes that the County could expect to dispose of highly treated effluent for reuse irrigation during approximately 208 days per year. During the 157 days of winter months, excess effluent would need to be discharged, stored, or disposed of by other means if additional nutrient allocations are not granted to the County. Other disposal alternatives could include in-ground disposal via low-pressure dosing or injection wells.

7.4 Local Storage and Alternatives Analysis

To evaluate the situation and requirements for reuse, it is necessary to examine the expected flows into the treatment facility and the amount of available reuse applications in the area over the scheduled time period. A proposed construction phasing of distribution lines, storage facilities and disposal facilities is necessary to meet the requirements for reuse based on the present nutrient allocations in the current VPDES permit.

Future flows into the WWTP were developed from a Connection-Based and a Population-Based analysis as discussed in Section 1.4. The flow projections were utilized to determine the pace of development, the build-out schedules, the date when reuse water could be utilized, and an estimated potential volume of reuse water. Potential reuse volume projections, grouped by service area, are provided in Table 7-4.

Table 7-4: Projected Potential Reuse Through Irrigation

Facility Served	2010	2015	2020	2030
1a. Belmont Subdivision 1b. Petro Truck Wash	596,400 gpd	596,400 gpd	596,400 gpd	596,400 gpd
2. High School Park	38,800 gpd	38,800 gpd	38,800 gpd	38,800 gpd
3. Mattaponi Golf Course	442,200 gpd	442,200 gpd	442,200 gpd	442,200 gpd
4a. Ladysmith Village 4b. Pendleton Subdivision 4c. Pendleton Golf Course 4d. South River Subdivision 4e. Bridlewood Subdivision 4f. Sports Complex	3,662,000 gpd	4,673,000 gpd	5,746,000 gpd	6,313,900 gpd
Total Projected Reuse Potential	4,739,400 gpd	5,750,400 gpd	6,823,400 gpd	7,391,300 gpd

From the information calculated in Table 7-4 and the future flow projection from Section 1.4, the needs for reuse over the growth period were calculated and matched with the timing of construction required for reuse facilities including distribution, storage, and disposal. Reuse needs based on growth from the Connection Based Analysis for the years 2010, 2015, 2020, and 2030 were examined first. It was assumed that all reuse for irrigation purposes would be used during the warm weather irrigation period of 208 days per year (refer to Section 7.4) and no reuse would be available to offset discharges during the winter

months, with the exception of the reuse volume used by the truck wash facility. The nutrient allocation is based on an annual loading. Therefore, all calculations may be simplified by calculating the volume of flow on an annual basis in million gallons per year (mg/yr). The County is allowed to discharge up to their present allocation, so the facility will be permitted to discharge an amount of 0.857 mgd or 312.8 mg/yr. An operational problem with this method is that without significant storage volume available at the treatment site, reuse volume during the irrigation season will be limited to the amount of effluent from the WWTP on a particular day. Table 7-5 summarizes the volume of reuse required between 2006 and 2030.

Table 7-5: Schedule of Reuse Flow and Volume Requirements and Recommended Improvements (Connection Based Analysis)

	Influent		Reuse Available [1]		Nutrient Allocation		Required Reuse Volume [2]	Reuse Volume w/out Storage [3]	Recommended Facilities
Year	Daily Avg. (mgd)	Annual Vol. (mg/yr)	Daily Avg. (mgd)	Annual Vol. (mg/yr)	Daily Avg. (mgd)	Annual Vol. (mg/yr)	(mg/yr)	(mg/yr)	
2006	0.25	91	3.1	639	0.857	312.8	0	60	See Note A
2010	0.8	292	4.74	994	0.857	312.8	0	174	See Note A
2015	1.4	511	5.75	1,196	0.857	312.8	198	299	See Note B
2020	2.1	766	6.82	1,427	0.857	312.8	443	437	See Note C
2030	2.7	985	7.39	1,555	0.857	312.8	672	569	See Note D

Notes:

A. No facilities required until after 2010.

B. Construct 4 mg elevated storage tank and reuse irrigation facilities for the Belmont Subdivision / Petro Truck Wash and Ladysmith Village / Pendleton Subdivision and Golf Course (Line Segments 1 and 4)

C. Construct 6 mg ground storage or subsurface disposal facilities for 0.058 mgd.

D. Construct 104 mg ground storage or subsurface disposal facilities for 0.65 mgd.

Footnotes:

[1] Yearly reuse volume is calculated reuse demand from Table 7-4 multiplied by 208 irrigation days per year.

[2] The required reuse volume is the annual effluent volume less the nutrient allocation annual volume.

[3] Average daily flow times 208 irrigation days/yr plus reuse at truck wash facility of 0.05 mgd times 157 days per year.

Storage volume requirements (Notes C and D) were calculated by comparing the reuse volume required with the reuse volume without storage for any one year to determine the storage volume required to dispose of the effluent that cannot be discharged to the stream.

Reuse needs based on growth from the Population Based Analysis for the years 2010, 2015, 2020, and 2030 were examined second. This population-based flow represents the maximum development that may occur in the service area. Table 7-6 summarizes these results.

Table 7-6: Schedule of Reuse Flow and Volume Requirements and Recommended Improvements (Population-Based Analysis)

Year	Influent Daily Avg. (mgd)	Influent Annual Vol. (mg/yr)	Reuse Available [1] Daily Avg. (mgd)	Reuse Available [1] Annual Vol. (mg/yr)	Nutrient Allocation Daily Avg. (mgd)	Nutrient Allocation Annual Vol. (mg/yr)	Required Reuse Volume [2] (mg/yr)	Reuse Volume w/out Storage [3] (mg/yr)	Recommended Facilities
2006	0.25	91	3.1	639	0.857	312.8	0	60	See Note A
2010	1.2	438	4.74	994	0.857	312.8	126	258	See Note B
2015	2.4	876	5.75	1,196	0.857	312.8	564	507	See Note C
2020	3.3	1,205	6.82	1,427	0.857	312.8	893	694	See Note D
2030	4.6	1,680	7.39	1,555	0.857	312.8	1,367	965	See Note E

Notes:

A. No facilities required until after 2010.

B. Construct reuse irrigation facilities for the Belmont Subdivision / Petro Truck Wash (Line Segment 1).

C. Construct a 4 mg elevated storage tank, 60 mg of ground storage volume, and reuse irrigation facilities for the Ladysmith Village / Pendleton Subdivision and Golf Course (Line Segment 4) or construct subsurface disposal facilities for 0.35 mgd.

D. Construct 200 mg ground storage or subsurface disposal facilities for 1.26 mgd.

E. Construct 410 mg ground storage or subsurface disposal facilities for 2.6 mgd.

Footnotes:

[1] Yearly reuse volume is calculated reuse demand from Table 7-4 multiplied by 208 irrigation days per year.

[2] The required reuse volume is the annual influent volume less the nutrient allocation annual volume.

[3] Average daily flow times 208 irrigation days/yr plus reuse at truck wash facility of 0.05 mgd times 157 days per year.

The cost of land was not considered in the evaluation of alternatives for the large storage basins. Low-pressure dosing was considered as an alternative to the storage basins. It was concluded that the storage basins are a less expensive alternative basin based on the current regulations for low-pressure dosing systems. If the regulations change before storage is required for the reuse system, low-pressure dosing should be re-evaluated as an alternative. A second alternative considered was the use of injection wells to supplement the reuse system. Presently, injection wells are not approved for this use in Virginia, but they should be considered as a future alternative to storage ponds as regulations change.

7.5 Proposed Reuse Irrigation infrastructure System Preliminary Design, Costs, and Layout

Table 7-7 provides a grouping of reuse facilities based on the potential usage that may be served by each line segment. Table 7-7 also provides the line size, length of line, unit cost, and total probable construction cost for the primary reuse infrastructure. These costs are for the primary infrastructure only. It is assumed that the cost of individual connections and piping within new subdivisions will be the responsibility of the developer. Elevated storage tanks for the reuse system will be needed to satisfy the peak day irrigation demand. Irrigation demands are not spread out evenly over a 24-hour period but tend to peak in the early morning and taper off over an 8-hour period. Storage is needed near the points of use to provide the volumes required during these peak periods.

The proposed irrigation system layout is illustrated in Figure 7-1.

Table 7-7: Opinion of Probable Construction Cost for Primary Reuse Irrigation Infrastructure

Line Segment/Description	Future Potential Usage	Line Size	Line Length	Unit Cost	Total Probable Construction Cost
1a. Belmont Subdivision	564,400 gpd	24 inch	21,500 LF	$157	$3,375,000
1b. Petro Truck Wash	50,000 gpd				
2. High School Park	38,800 gpd	6 inch	18,000 LF	$45	$810,000
3. Mattaponi Golf Course	442,200 gpd	12 inch	24,500 LF	$77	$1,886,000
4a. Ladysmith Village	1,999,500 gpd				
4b. Pendleton Subdivision	1,929,800 gpd				
4c. Pendleton Golf Course	1,784,200 gpd	24 inch	43,000 LF	$157	$6,751,000
4d. South River Subdivision	294,500 gpd				
4e. Bridlewood Subdivision	171,300 gpd				
4f. Sports Complex	134,600 gpd				
Total Potential Usage	7,391,300 gpd				
4 mg Elevated Storage Tank					$4,000,000

For existing developed subdivisions, additional costs would include the cost of individual residential lot connections required for customers in existing residential subdivisions, as shown in Table 7-8. As these are existing developed lots, the cost of the infrastructure within the subdivisions may have to be paid by the County. Therefore, it is not recommended that existing subdivisions be utilized unless necessary.

Table 7-8: Summary of Construction Costs for Existing Residential Lot Connections

Subdivision Name [1]	Connections	Cost / Connection	Total Probable Construction Cost
Belmont	381	$5,000	$1,905,000
Pendleton	300	$5,000	$1,500,000
Total	681		$3,405,000

[1] The South River and Bridlewood Subdivisions have not been included in the summary of connection costs as they are just beginning the early stages of development.

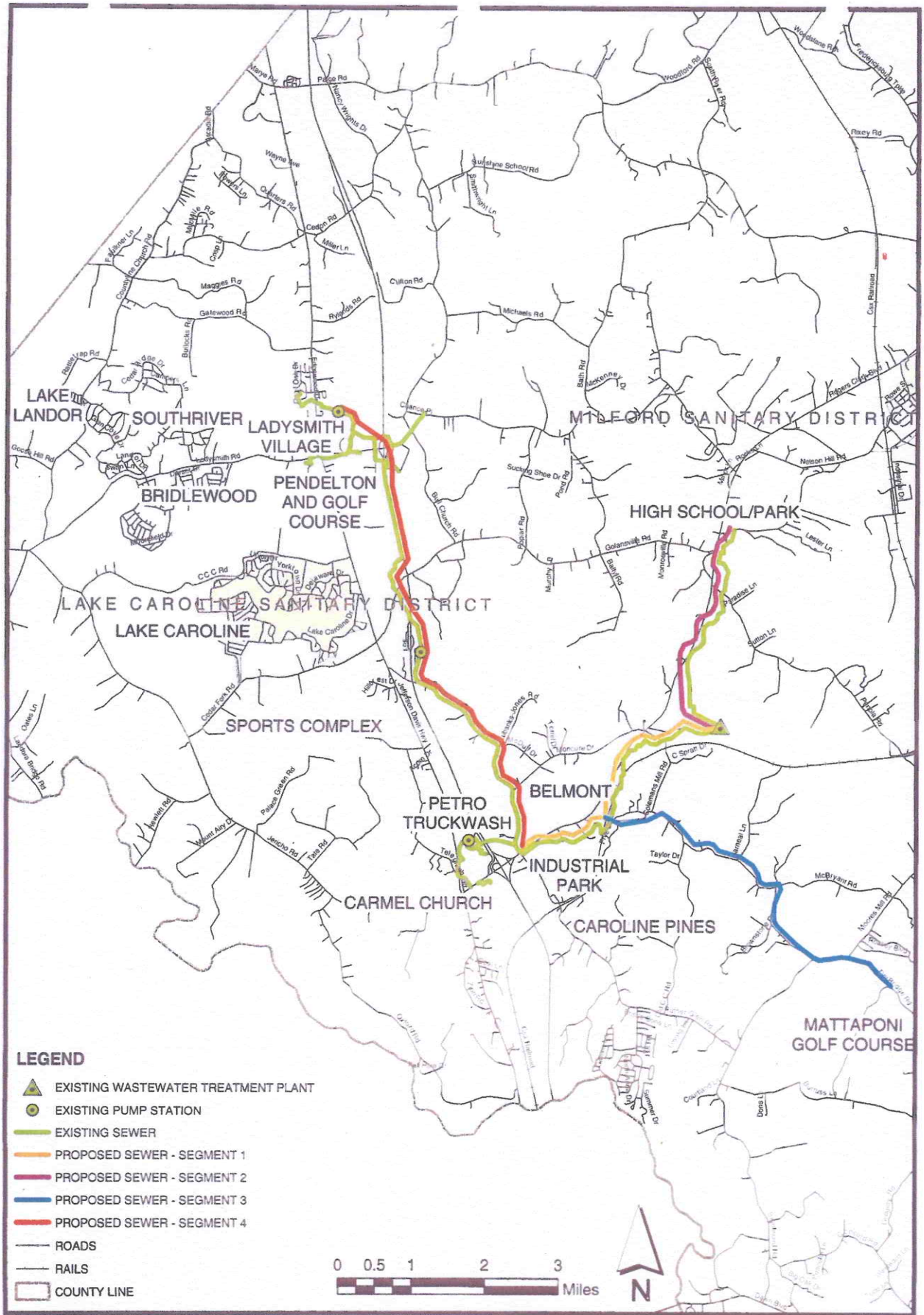
The costs shown in Tables 7-7 and 7-8 are for construction of reuse irrigation infrastructure that would serve all potential usages. The entire facilities are not all required and the recommended facilities and phasing is shown in Table 7-9 and 7-10.

Tables 7-9 and 7-10 present the opinion of probable construction costs using the Connection Based methodology and the Population Based projection methodology, respectively. It is estimated that $16.3 million will be required for the reuse irrigation system based on the Connection Base Analysis method of estimating reuse flows. It is estimated that $22.6 million will be required for the reuse irrigation system based on the Population Based Analysis method of estimating reuse flows.

Table 7-9: Opinion of Probable Project Cost for Reuse Infrastructure (Connection Based Analysis)

Year	Facilities Required	Construction Cost (2006 $)	Total Project Cost (2006 $) [1]
2006	None	$0	$0
2010	None	$0	$0
2015	Reuse irrigation facilities for the Belmont Subdivision / Petro Truck Wash and Ladysmith Village / Pendleton Subdivision and Golf Course (Line Segment 1)	$10,126,000	$15,189,000
	Construct 4 mg elevated storage tank	$4,000,000	6,000,000
2020	Construct 6 mg ground storage tank	$205,000	$308,000
2030	Construct 104 mg ground storage tank	$2,160,000	$3,240,000
	Totals	**$16,491,000**	**$24,737,000**

[1] Includes 25% construction cost contingence and 20% technical and legal costs.



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Infrastructure, buildings, environment

CAROLINE COUNTY WWTP DISCHARGE OFFSET FACILITIES INFRASTRUCTURE SYSTEM LAYOUT

Figure 7-1

BIOMONITORING RESULTS
Caroline Regional Wastewater Treatment Plant (VA0073504)

Table 1
Summary of Toxicity Test Results for Outfall 001

TEST DATE	TEST TYPE/ORGANISM	IC_{25} (%)	48-HOUR LC_{50} (%)	NOEC (%)	% SURV	TU_C	REMARKS
Permit Reissued June 9, 2002							
08/06/02	Chronic *C. dubia*	17.4	>100	100 S **<22.7 R**	80	**>4.41**	1st quarterly
08/06/02	Chronic *P. promelas*	>100	>100	100 SG	73	1	
12/03/02	Chronic *C. dubia*	>100	>100	100 SR	100	1	2nd quarterly
12/03/02	Chronic *P. promelas*	>100	>100	100 SG	88	1	
02/11/03	Chronic C. dubia	7.3	>100	**17 S** **8 R**	100	**5.88**	3rd quarterly Anomalous dose response
02/11/03	Chronic *P. promelas*	6.4	>100	**8 SG**	63	**12.5**	
05/13/03	Chronic *C. dubia*	>100	>100	100 SR	100	1	4th quarterly
05/13/03	Chronic *P. promelas*	96.7	>100	100 S 69 G	83	1.45	
09/23/03#	Chronic *C. dubia*	>100	>100	100 SR	90	1	5th quarterly
09/23/03#	Chronic *P. promelas*	>100	>100	100 SG	98	1	
12/16/03#	Chronic *C. dubia*	>100	>100	100 SR	100	1	6th quarterly
12/16/03#	Chronic *P. promelas*	>100	>100	100 SG	95	1	
02/24/04#	Chronic *C. dubia*	>100	>100	100 SR	100	1	7th quarterly
02/24/04#	Chronic *P. promelas*	>100	>100	100 SG	90	1	
06/08/04	Chronic *C. dubia*	>100	>100	100 SR	90	1	8th quarterly
06/08/04	Chronic *P. promelas*	>100	>100	100 SG	93	1	
12/07/04	Chronic *C. dubia*	>100	>100	100 SR	100	1	1st annual
12/07/04	Chronic *P. promelas*	>100	>100	**17 SG**	95	**5.88**	Anomalous dose response, pathogen present likely
05/03/05#	Chronic *C. dubia*	>100	>100	100 SR	100	1	Retest
05/03/05#	Chronic *P. promelas*	>100	>100	100 SG	98	1	
09/13/05#	Chronic *C. dubia*	>100	>100	100 SR	100	1	2nd annual
09/13/05#	Chronic *P. promelas*	>100	>100	100 SG	100	1	
07/18/06#	Chronic *C. dubia*	>100	>100	100 SR	90	1	
07/18/06#	Chronic *P. promelas*	>100	>100	100 SG	93	1	
Permit reissued 18 June 2007							
10/08/07	Chronic *C. dubia*	9.2	>100	100 S **8 R**	90	**12.5**	
10/08/07	Chronic *P. promelas*	>100	>100	100 SG	93	1	
03/24/08	Chronic *C. dubia*	5.2	>100	100 S **<8 R**	90	**12.5**	
03/24/08	Chronic *P. promelas*	7.5	>100	**<8 SG**	90	**12.5**	
05/13/08#	Chronic *C. dubia*	>100	>100	100 SR	100	1	1st Annual
05/13/08#	Chronic *P. promelas*	>100	>100	100 SG	90	1	

TEST DATE	TEST TYPE/ORGANISM	IC_{25} (%)	48-HOUR LC_{50} (%)	NOEC (%)	% SURV	TU_C	REMARKS
09/21/09[#]	Chronic *C. dubia*	>100	>100	100 SR	100	1	2nd Annual
09/21/09[#]	Chronic *P. promelas*	>100	>100	100 SG	95	1	
10/19/10	Chronic *C. dubia*	>100	23.5	100 S **17 R**	90	**5.88**	3rd Annual
10/19/10	Chronic *P. promelas*	>100	>100	100 SG	95	1	
10/24/11	Chronic *C. dubia*	>100	>100	100 SR	100	1	4th Annual
10/24/11	Chronic *P. promelas*	>100	>100	100 SG	100	1	

[#]Samples pretreated with UV radiation to guard against pathogen interference.

ABBREVIATIONS:
SR – Survival and Reproduction
SG – Survival and Growth
% SURV - Percent survival in 100% effluent

Bold-faced NOEC or TUc values indicate that NOEC exceeded the chronic toxicity criteria.

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Caroline County, Virginia.

PUBLIC COMMENT PERIOD: TBD, 2012 to 5:00 p.m. on TBD, 2012

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Caroline County Public Utilities
P.O. Box 424, Bowling Green, VA 22427
VA0073504

NAME AND ADDRESS OF FACILITY: Caroline County Regional Wastewater Treatment Plant
22101 Rogers Clark Blvd, Ruther Glen, VA 22546

PROJECT DESCRIPTION: Caroline County Public Utilities has applied for a reissuance of a permit for the public Caroline County Regional Wastewater Treatment Plant. The applicant proposes to release treated sewage wastewaters from light industrial and residential areas at a rate of 0.50 million gallons per day into a water body. The permit also includes expansions at 1.5 and 3.0 million gallons per day. Sludge from the treatment process will be disposed via landfill. The facility proposes to release the treated sewage in the Polecat Creek in Caroline County in the York River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, carbonaceous-Biochemical Oxygen Demand, Total Suspended Solids, Total Kjeldahl Nitrogen, Dissolved Oxygen, *E. coli*, Nitrate-Nitrite as N, Total Nitrogen, Total Phosphorus, Total Recoverable Copper and Total Recoverable Zinc.

This facility is subject to the requirements of 9VAC25-820 and has registered for coverage under the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia. As a condition of this permit, the permittee will be required to offset in advance, any loads of total nitrogen or total phosphorus that are expected to be discharged in a given calendar year, in excess of those levels previously allowed by the facility's VPDES permit. The permittee has opted to install nutrient removal treatment that will maintain the existing load of nutrients discharged.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

Contact for public comments, document requests and additional information: The public may review the documents at the DEQ-Northern Regional Office by appointment or may request electronic copies of the draft permit and fact sheet.

Name: Douglas Frasier
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3873 E-mail: Douglas.Frasier@deq.virginia.gov Fax: (703) 583-3821

Revised 2/2003

State "Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name:	Caroline County Regional Wastewater Treatment Plant
NPDES Permit Number:	VA0073504
Permit Writer Name:	Douglas Frasier
Date:	8 March 2012

Major [X] **Minor** [ ] **Industrial** [ ] **Municipal** [X]

I.A. Draft Permit Package Submittal Includes:	**Yes**	**No**	**N/A**
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?	X		
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?	X		
6. A Reasonable Potential analysis showing calculated WQBELs?	X		
7. Dissolved Oxygen calculations?			X
8. Whole Effluent Toxicity Test summary and analysis?	X		
9. Permit Rating Sheet for new or modified industrial facilities?			X

I.B. Permit/Facility Characteristics	**Yes**	**No**	**N/A**
1. Is this a new or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet **or** permit contain a description of the wastewater treatment process?	X		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?		X	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?	X		
7. Does the fact sheet **or** permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?	X		
a. Has a TMDL been developed and approved by EPA for the impaired water?		X	
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?	X		
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	X		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?		X	

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?	X		
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?	X		
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?	X		
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Checklist – for POTWs
(To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration	**Yes**	**No**	**N/A**
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements	**Yes**	**No**	**N/A**
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?			X

II.C. Technology-Based Effluent Limits (POTWs)	**Yes**	**No**	**N/A**
1. Does the permit contain numeric limits for ALL of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

II.D. Water Quality-Based Effluent Limits	**Yes**	**No**	**N/A**
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?			X
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?			X
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	X		

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?	X		

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?			X

II.F. Special Conditions – cont.	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?			X
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
a. Does the permit require implementation of the "Nine Minimum Controls"?			X
b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?	X		

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		

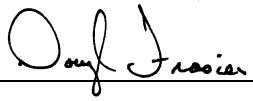
List of Standard Conditions – 40 CFR 122.41

Duty to comply	Property rights	Reporting Requirements
Duty to reapply	Duty to provide information	Planned change
Need to halt or reduce activity not a defense	Inspections and entry	Anticipated noncompliance
	Monitoring and records	Transfers
Duty to mitigate	Signatory requirement	Monitoring reports
Proper O & M	Bypass	Compliance schedules
Permit actions	Upset	24-Hour reporting
		Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?	X		

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	Douglas Frasier
Title	VPDES Permit Writer, Senior II
Signature	
Date	8 March 2012